

01:47:51 1 in each map.

01:47:52 2 Right?

01:47:55 3 A. Yes.

01:47:56 4 Q. And that row shows that the  
01:47:58 5 Gressman Math Science Petitioner's map  
01:48:01 6 has 19 split municipalities.

01:48:03 7 Right?

01:48:04 8 A. I would say that this chart has  
01:48:05 9 inadequate information, but yes.

01:48:08 10 Q. And if you look at the entire  
01:48:10 11 table, that 19 split municipalities  
01:48:15 12 listed in this table, that's the  
01:48:17 13 lowest number of split municipalities  
01:48:20 14 of all of the proposed maps and also  
01:48:22 15 the 2018 plan.

01:48:23 16 Correct?

01:48:24 17 A. Where am I looking? I see the  
01:48:26 18 19. What else am I supposed to be  
01:48:29 19 looking at?

01:48:30 20 Q. Right. So if you just scan  
01:48:31 21 across the table ---

01:48:31 22 A. Right.

01:48:32 23 Q. --- in that same row ---.

01:48:33 24 A. Okay.

01:48:34 25 Q. I don't want to put my hand on

01:48:36 1 that.

01:48:36 2 A. Oh, when you're pointing out

01:48:38 3 --- you want me to say 19 is lower

01:48:41 4 than 29?

01:48:43 5 Q. Well --- I want you to say it's

01:48:45 6 lower than every number in that table.

01:48:45 7 A. I apologize. Yes. I'm sorry,

01:48:50 8 yes.

01:48:50 9 Q. And so can you take a look at

01:48:52 10 the next table, Table 7?

01:48:54 11 A. Is that the one that is still

01:48:56 12 on the screen, right below 23,

01:48:59 13 paragraph 23?

01:49:01 14 Q. Yes?

01:49:02 15 A. Okay. Yes.

01:49:03 16 Q. And Table 7 shows all political

01:49:05 17 subdivision pieces and all of the

01:49:07 18 parties maps as well as the 2018 plan.

01:49:09 19 Right?

01:49:10 20 A. Yes.

01:49:11 21 Q. And in the middle row, again,

01:49:13 22 shows the total number of split

01:49:16 23 municipalities in each map.

01:49:20 24 Right?

01:49:20 25 A. Yes.

01:49:20 1 Q. And that row shows that the  
01:49:22 2 Gressman Math Science Petitioners map  
01:49:24 3 is tied for the lowest number of  
01:49:26 4 municipality pieces of all the  
01:49:28 5 proposed maps and also the 2018 plan.

01:49:30 6 Correct?

01:49:34 7 A. Yes.

01:49:40 8 Q. So in your report --- do you  
01:49:42 9 have your report? I'm not sure if you  
01:49:44 10 have it.

01:49:44 11 A. No, I do not.

01:49:45 12 Q. Okay.

01:49:45 13 If you need to see anything,  
01:49:46 14 just let me know.

01:49:47 15 A. Thank you.

01:49:48 16 Q. So in your report you state  
01:49:50 17 that harm from splitting  
01:49:52 18 municipalities should be calculated on  
01:49:55 19 the total population affected by  
01:49:57 20 municipal splits not the number of  
01:50:00 21 splits.

01:50:00 22 Right?

01:50:01 23 A. Yes.

01:50:01 24 Q. And you also stated that the  
01:50:03 25 Reschenthaler maps are better than all

01:50:05 1 but the House Republican and Citizens  
01:50:06 2 vote maps when calculating the total  
01:50:09 3 population affected by municipal  
01:50:12 4 splits and not the number of splits.

01:50:14 5 Right?

01:50:14 6 A. That is based on the  
01:50:15 7 information that I received and that I  
01:50:18 8 calculated. I certainly welcome a  
01:50:20 9 confirmation of my numbers.

01:50:22 10 Q. Okay.

01:50:23 11 A. But yes, that's what I said in  
01:50:24 12 the report.

01:50:24 13 Q. And you give specific numbers.  
01:50:27 14 You state that removing Philadelphia  
01:50:29 15 as the City must be split,  
01:50:31 16 Reschenthaler map 1 splits communities  
01:50:33 17 representing 1.567 percent and the  
01:50:36 18 remaining population will  
01:50:38 19 Reschenthaler map 2 splits 1.575  
01:50:43 20 percent.

01:50:43 21 Right?

01:50:44 22 A. And that is of the remainder,  
01:50:46 23 and I think that is the appropriate  
01:50:49 24 math. You have to split Philadelphia,  
01:50:50 25 so you should take that out of the

01:50:52 1 denominator and consider the rest of  
01:50:54 2 the population, but yes, that's what  
01:50:56 3 my calculator came up with. But  
01:50:56 4 again, I'd certainly welcome a  
01:50:56 5 confirmation if someone wants to  
01:51:05 6 provide it.

01:51:05 7 Q. Okay.

01:51:05 8 And in concluding that these  
01:51:07 9 maps performed better on total  
01:51:08 10 population affected by municipal  
01:51:10 11 splits than most of the other proposed  
01:51:12 12 maps, you had to calculate the same  
01:51:14 13 percentages for the other maps.

01:51:15 14 Right?

01:51:19 15 A. Yes.

01:51:19 16 Q. But you didn't disclose the  
01:51:21 17 percentages you calculated for any of  
01:51:24 18 the other proposed maps in your  
01:51:26 19 report.

01:51:26 20 Right?

01:51:27 21 A. Well, let me --- let me  
01:51:28 22 explain. No, I --- okay. I apologize  
01:51:31 23 for my previous answer. What I was  
01:51:34 24 provided was the total population that  
01:51:36 25 was split, that was split from all the

01:51:40 1 communities. And so I just looked at  
01:51:42 2 total population because obviously  
01:51:45 3 when you convert it into a percentage  
01:51:47 4 the smaller that numerator is, the  
01:51:50 5 lower the percentage.

01:51:51 6 So I didn't calculate the  
01:51:53 7 percentage for each one because it  
01:51:57 8 wasn't necessary. I just needed to  
01:51:58 9 know what the numerator was in order  
01:52:00 10 to know which maps performed better.  
01:52:03 11 So I apologize if I made a mistake in  
01:52:07 12 precision. I did not calculate the  
01:52:09 13 percentages, but I didn't need to.  
01:52:12 14 All you need is the numerator to  
01:52:14 15 determine whether the percent is  
01:52:18 16 higher or lower.

01:52:19 17 Q. And I just want to understand.  
01:52:20 18 So you did determine this figure for  
01:52:24 19 every one of the proposed maps.

01:52:26 20 Correct?

01:52:26 21 A. I was provided a list of the  
01:52:28 22 communities and I was provided a total  
01:52:29 23 for each community. I did not go  
01:52:32 24 through the census data. I was  
01:52:36 25 provided with information from my

01:52:37 1 client that listed all the population  
01:52:39 2 numbers.

01:52:39 3 Q. Right.

01:52:40 4 A. So subject to that information  
01:52:42 5 that I received, that is what I based  
01:52:45 6 my information on, my ranking. Again,  
01:52:49 7 I welcome a confirmation of that.

01:52:52 8 Q. And so I just want to confirm  
01:52:53 9 the way that you got to these  
01:52:55 10 percentages, understanding, you know,  
01:52:57 11 that you received --- maybe you didn't  
01:52:59 12 do all of the full math to get to the  
01:53:02 13 number, because you had some of it  
01:53:03 14 done for you.

01:53:04 15 But am I right that the total  
01:53:07 16 population number that you used ---  
01:53:11 17 well, I'll start here. So am I right  
01:53:13 18 that you first figured out what  
01:53:15 19 municipalities were split in each  
01:53:17 20 plan?

01:53:18 21 A. I was provided with the list.  
01:53:20 22 I was provided with the list and I was  
01:53:22 23 provided with the population numbers.

01:53:25 24 Q. Okay.

01:53:26 25 A. And actually, I was provided an

01:53:29 1 excel sheet and those numbers were sum  
01:53:32 2 forming, and then, you know, I looked  
01:53:33 3 at the bigger, smaller ones and then I  
01:53:36 4 made that calculation.

01:53:37 5 Q. I see. I see. Now I  
01:53:39 6 understand. So the total population  
01:53:42 7 numbers that were provided for you,  
01:53:44 8 they excluded Philadelphia.

01:53:45 9 Correct?

01:53:47 10 A. No, they included Philadelphia.

01:53:48 11 Q. Okay.

01:53:49 12 So then in doing your --- yeah,  
01:53:53 13 I'm sorry.

01:53:54 14 A. I subtracted Philadelphia  
01:53:55 15 because you have to split it. Like  
01:53:58 16 why are you including it in the  
01:54:01 17 enumerator and the denominator,  
01:54:03 18 because you have to split the  
01:54:05 19 community.

01:54:05 20 So why would you include it in  
01:54:07 21 the percentage of something you got to  
01:54:09 22 split anyway. So my calculation was  
01:54:11 23 based on the remainder, and I think  
01:54:13 24 that's legitimate.

01:54:14 25 Now, if you include the City of



01:54:16 1 Philadelphia, it doesn't change the  
01:54:18 2 relative rankings, it just adds to the  
01:54:18 3 enumerator and the denominator. You  
01:54:20 4 just get a different number, but the  
01:54:21 5 rankings stay the same, so it's kind  
01:54:24 6 of a superfluous kind of move.

01:54:31 7 Q. And this final percentage  
01:54:32 8 number, though, it excludes  
01:54:34 9 Philadelphia and it also excludes  
01:54:40 10 municipalities that were split along  
01:54:43 11 county lines.

01:54:44 12 Right?

01:54:44 13 A. I was only provided the list of  
01:54:47 14 communities that were split on the map  
01:54:49 15 --- on the drawing of the map. I know  
01:54:51 16 there are --- there are fairly small  
01:54:53 17 number of communities in Pennsylvania  
01:54:54 18 that straddle counties, like McDonald  
01:54:58 19 and Trafford, and I think Bethlehem  
01:55:00 20 does, so I didn't calculate whether a  
01:55:03 21 community is in a different county. I  
01:55:04 22 was only given a list of communities  
01:55:06 23 that were split in the Congressional  
01:55:09 24 District.

01:55:09 25 Q. Okay.

01:55:11 1 And so am I understanding  
01:55:13 2 correctly that you didn't --- you  
01:55:14 3 didn't do the math to get to these  
01:55:15 4 numbers. You were given a chart with  
01:55:17 5 the percentages in them and you just  
01:55:26 6 arranged ---?

01:55:27 7 A. No. No, no, no. I was  
01:55:28 8 provided a list of the communities  
01:55:29 9 that were split with their populations  
01:55:30 10 and the sum. So I was given a list  
01:55:35 11 that says, okay, here are these maps  
01:55:36 12 and here are how many people live in  
01:55:39 13 split municipalities.

01:55:45 14 Q. Okay.

01:55:45 15 A. And then all I did in that was  
01:55:45 16 say, okay, here's the ranking. Here's  
01:55:45 17 --- here's what --- here's who ---  
01:55:52 18 here's the population --- the total  
01:55:53 19 populations. Here are the least ---  
01:55:55 20 where the least number of populations  
01:55:57 21 are split.

01:55:58 22 Q. Okay.

01:55:59 23 And so are you aware then that  
01:56:02 24 using the math that was done to get to  
01:56:05 25 this figure for the Reschenthaler map

01:56:07 1 in your report that the Gressman math  
01:56:11 2 science petitioners map splits  
01:56:12 3 municipalities representing just 1.72  
01:56:15 4 --- I'm sorry, 1.712 percent of the  
01:56:19 5 population?

01:56:19 6 A. In my review of the data I saw  
01:56:21 7 that the Gressman map does split more,  
01:56:24 8 a higher number of people than the  
01:56:25 9 Reschenthaler map, yes.

01:56:26 10 Q. Well, the difference, though,  
01:56:28 11 in that number is it's between --- the  
01:56:31 12 difference between the Reschenthaler  
01:56:33 13 figure for map 1 and the Gressman  
01:56:35 14 math/science Petitioners map is 1.712  
01:56:40 15 --- I'm sorry. The difference between  
01:56:42 16 that number for the Gressman  
01:56:44 17 math/science Petitioners map and for  
01:56:48 18 Reschenthaler map 1, subject to your  
01:56:48 19 verification, is 0.145 percent.

01:56:57 20 Right?

01:56:57 21 A. Well, actually it's --- I  
01:57:01 22 wouldn't say percent, I would say  
01:57:03 23 points. Because percent would imply  
01:57:05 24 percentage of the whole. So it would  
01:57:10 25 be 0.14 --- what you said, points,

01:57:12 1 rather than a percentage, yeah.

01:57:14 2 Q. But that's barely one-seventh

01:57:14 3 of one percent or one point.

01:57:23 4 Right?

01:57:24 5 A. I mean, yes.

01:57:25 6 Q. And so the difference is ---

01:57:27 7 well, between Reschenthaler map 2 and

01:57:27 8 Gressman math/science Petitioners

01:57:27 9 similarly is 0.137 points. So again

01:57:27 10 similarly ---.

01:57:37 11 A. The Gressman map exceeds the

01:57:40 12 Reschenthaler map but not by as much

01:57:42 13 as others, correct.

01:57:43 14 Q. And so the difference is small,

01:57:45 15 correct, between those two maps?

01:57:47 16 A. I think the raw number is

01:57:49 17 really what matters. I mean, the

01:57:51 18 percentage --- you know, it's nice to

01:57:53 19 talk percentages because they look

01:57:55 20 smaller, but I think the raw number is

01:57:57 21 what matters. But you know, the

01:58:02 22 Gressman map benefits significantly

01:58:04 23 because it doesn't split the city and

01:58:06 24 so it makes that number much smaller.

01:58:08 25 Q. And I see I'm out of time.

01:58:10 1 A. Oh, I'm sorry.

01:58:10 2 Q. No, no, you're fine. Thank  
01:58:10 3 you, Dr. Naughton.

01:58:14 4 A. Thank you.

01:58:14 5 JUDGE McCULLOUGH:

01:58:16 6 Thank you, Counsel. And  
01:58:21 7 now we will hear from attorneys for  
01:58:23 8 Respondent Governor, I assume not  
01:58:26 9 Secretary. Okay. Mr. Wiygul.

01:58:36 10 ATTORNEY WIYGUL:

01:58:37 11 Thank you, Your Honor.  
01:58:38 12 I theoretically wear two hats, but  
01:58:40 13 I've really only been wearing the one.

01:58:43 14 JUDGE McCULLOUGH:

01:58:43 15 Right.

01:58:43 16 ---

01:58:43 17 CROSS EXAMINATION

01:58:43 18 ---

01:58:43 19 BY ATTORNEY WIYGUL:

01:58:45 20 Q. I think it's still morning, but  
01:58:46 21 I have not checked, Doctor.

01:58:46 22 A. Good morning.

01:58:50 23 Q. How are you? My name is Robert  
01:58:53 24 Wiygul. I'm representing Governor  
01:58:55 25 Wolf in this case.

01:58:56 1 A. Nice to meet you.

01:58:56 2 Q. I think some of this has been

01:58:58 3 covered already, but I want to nail

01:59:00 4 some things down?

01:59:01 5 A. Sure.

01:59:01 6 Q. You don't purport to be a data

01:59:04 7 scientist.

01:59:04 8 Correct?

01:59:05 9 A. Correct.

01:59:06 10 Q. You don't purport to be a

01:59:08 11 scholar in the area of redistricting.

01:59:10 12 Correct?

01:59:10 13 A. Correct.

01:59:10 14 Q. You have not published any

01:59:13 15 peer-reviewed articles on

01:59:13 16 redistricting.

01:59:15 17 Correct?

01:59:15 18 A. Correct.

01:59:16 19 Q. Have you published any articles

01:59:18 20 on the subject of redistricting

01:59:20 21 specifically?

01:59:21 22 A. I think I may have written an

01:59:24 23 opinion piece for The Hill, but it's

01:59:27 24 been quite sometime in which I was of

01:59:30 25 the opinion that we were focused too

01:59:34 1 much on the shapes of communities when  
01:59:36 2 we really need to think about what  
01:59:38 3 serves the voters' interests and what  
01:59:41 4 really matters in issues of  
01:59:44 5 representation, which are far more  
01:59:45 6 complicated.

01:59:45 7 Q. Okay.

01:59:46 8 I understand?

01:59:47 9 A. So what I'm saying today is  
01:59:48 10 consistent with an opinion that I've  
01:59:50 11 have.

01:59:50 12 Q. Sir, my question is just have  
01:59:53 13 you published articles. You mentioned  
01:59:53 14 the one in The Hill. You'll agree  
01:59:53 15 with me The Hill is not ---?

01:59:54 16 A. I should say I contributed an  
01:59:57 17 article.

01:59:57 18 Q. You'll agree with me The Hill  
02:00:03 19 is not a scholarly publication.

02:00:04 20 Correct?

02:00:04 21 A. Yes.

02:00:04 22 Q. Do you have any experience  
02:00:06 23 working on the redistricting process,  
02:00:08 24 advising Redistricting Commissions,  
02:00:10 25 otherwise advising redistricting

02:00:10 1 bodies?

02:00:16 2 A. Well ---.

02:00:18 3 Q. I think it's a yes or no.

02:00:21 4 Isn't it?

02:00:21 5 A. I don't --- I've never had a  
02:00:25 6 formal position in redistricting. I'm  
02:00:27 7 certain that in the past I've offered  
02:00:31 8 opinions --- I know that I've offered  
02:00:33 9 opinions to people who have been  
02:00:35 10 involved in the redistricting process.  
02:00:39 11 I know that I've been solicited for my  
02:00:39 12 opinion in the past. But it's  
02:00:41 13 informal, so it's not part of any  
02:00:43 14 public record.

02:00:43 15 Q. Okay.

02:00:43 16 And you'll agree with me that  
02:00:45 17 you don't cite any of that in your  
02:00:46 18 report.

02:00:46 19 Correct?

02:00:47 20 A. Correct. I felt ---.

02:00:49 21 Q. Just yes or no.

02:00:50 22 A. You're saying professional  
02:00:51 23 stuff, so I didn't think it was ---.

02:00:52 24 Q. My time is limited.

02:00:53 25 A. Oh, I'm sorry. I'm sorry.



02:00:54 1 Q. I'm not trying to cut you off.  
02:00:56 2 I'm just trying to be efficient.  
02:00:57 3 A. I understand. I understand. I  
02:00:59 4 apologize.  
02:00:59 5 Q. And we'll agree --- I think  
02:01:01 6 this has been covered, too. You don't  
02:01:02 7 cite to any literature, academic,  
02:01:04 8 scholarly literature, in your report  
02:01:06 9 to support any of the theories that  
02:01:07 10 you offer.  
02:01:08 11 Correct?  
02:01:09 12 A. Correct. It's based on my  
02:01:10 13 expert opinion.  
02:01:11 14 Q. And you don't identify any  
02:01:13 15 methodology of any kind that you apply  
02:01:15 16 to derive your conclusions, it's based  
02:01:19 17 on just your personal opinion and  
02:01:22 18 experience.  
02:01:22 19 Is that fair?  
02:01:23 20 A. I don't think personal opinion.  
02:01:25 21 I think it's providing my expert and  
02:01:27 22 professional opinion.  
02:01:27 23 Q. We can agree that it's not the  
02:01:30 24 result of an application of a  
02:01:31 25 methodology?

02:01:33 1 A. Well, no, I mean, there's a  
02:01:36 2 methodology.

02:01:36 3 Q. What is the methodology?

02:01:38 4 A. The methodology is based on  
02:01:42 5 judgment and personal experience. I  
02:01:43 6 think what you're getting at is, is it  
02:01:45 7 a mathematical ---.

02:01:45 8 Q. Sir, I just want to know what  
02:01:46 9 the methodology is.

02:01:47 10 ATTORNEY HAVERSTICK:

02:01:48 11 Your Honor.

02:01:48 12 JUDGE McCULLOUGH:

02:01:48 13 Okay.

02:01:49 14 Mr. Haverstick, I know.  
02:01:50 15 Let him finish.

02:01:52 16 ATTORNEY HAVERSTICK:

02:01:52 17 Well, if you ask --- you  
02:01:55 18 go first. You're the Judge.

02:01:56 19 JUDGE McCULLOUGH:

02:01:56 20 Go ahead state your  
02:01:58 21 objection.

02:01:59 22 ATTORNEY HAVERSTICK:

02:01:59 23 If it's not a yes or no  
02:02:00 24 question and it's a question that begs  
02:02:02 25 a narrative answer, then, you know ---

02:02:08 1 if he's going to ask a narrative  
02:02:08 2 question, then the witness should be  
02:02:10 3 allowed to give a narrative answer,  
02:02:10 4 not stop when it's not convenient  
02:02:14 5 anymore for counsel.

02:02:15 6 JUDGE McCULLOUGH:

02:02:15 7 So noted. But I do  
02:02:16 8 note, again, I ask the witness it  
02:02:19 9 seems you answer a question, you stop,  
02:02:21 10 and then you keep going. And I think  
02:02:23 11 it's confusing counsel. So you can  
02:02:25 12 say, wait, I need to say something  
02:02:27 13 else, but can you make it clear  
02:02:29 14 because I mean, counsel moves onto his  
02:02:31 15 next question at your pause and then  
02:02:32 16 you add another statement?

02:02:32 17 THE WITNESS:

02:02:35 18 I was kind of forming my  
02:02:37 19 thoughts. I apologize.

02:02:38 20 ATTORNEY WIYGUL:

02:02:39 21 Thank you.

02:02:39 22 JUDGE McCULLOUGH:

02:02:39 23 All right.

02:02:39 24 BY ATTORNEY WIYGUL:

02:02:41 25 Q. You understand in this case

02:02:41 1 that in making a decision in this case  
02:02:45 2 this Court is constrained to follow  
02:02:47 3 the precedential decisions of the  
02:02:49 4 Pennsylvania Supreme Court.

02:02:51 5 Correct?

02:02:52 6 A. Well I'm not an expert in the  
02:02:53 7 law, so I don't think I can make that  
02:02:55 8 judgment.

02:02:55 9 Q. Okay.

02:02:56 10 I'll represent to you that  
02:02:57 11 that's the case. You can trust me or  
02:02:58 12 not, but you're aware that one  
02:03:02 13 precedential decision by the  
02:03:03 14 Pennsylvania Supreme Court on the  
02:03:04 15 subject of redistricting is the League  
02:03:08 16 of Women Voters case from 2018?

02:03:09 17 A. Again, I'm not an attorney, so  
02:03:10 18 I didn't review, you know, the Supreme  
02:03:13 19 Court docket or anything of that  
02:03:14 20 nature, so I can't make any  
02:03:16 21 representation.

02:03:16 22 Q. Are you aware of the existence  
02:03:18 23 of that case?

02:03:21 24 A. What case is that?

02:03:24 25 Q. League of Women Voters versus

02:03:26 1 the Commonwealth decided by the  
02:03:27 2 Pennsylvania Supreme Court in 2018,  
02:03:28 3 February of 2018.  
02:03:29 4 A. I think I may have seen a  
02:03:32 5 citation to it, but I mean awareness  
02:03:35 6 implies sort of a kind of familiarity,  
02:03:37 7 and I don't want to represent that,  
02:03:39 8 but I think I've seen --- I've seen it  
02:03:42 9 cited.  
02:03:43 10 Q. Have you ever read the Opinion  
02:03:44 11 or any portion of it?  
02:03:45 12 A. Pardon me.  
02:03:45 13 Q. Have you ever read the Opinion  
02:03:47 14 or any portion of it?  
02:03:49 15 A. Pardon me.  
02:03:49 16 Q. Have you ever read the Opinion?  
02:03:49 17 A. I have not read the Opinion.  
02:03:50 18 Q. Have you ever had any summary  
02:03:51 19 of the Opinion?  
02:03:58 20 A. I don't believe so.  
02:03:59 21 Q. So it's fair to say you don't  
02:04:01 22 know what the factors discussed in  
02:04:02 23 that Opinion are?  
02:04:08 24 A. Yes.  
02:04:09 25 Q. Is that fair?

02:04:10 1 A. Okay.

02:04:11 2 Q. Correct?

02:04:11 3 A. I'm not aware of the fact, yes.

02:04:15 4 Q. Okay.

02:04:15 5 Have you ever --- well, I think

02:04:17 6 I know the answer to this question

02:04:18 7 based on what you said, but your

02:04:20 8 testimony would then be that you never

02:04:22 9 commented on that Decision in any way?

02:04:25 10 A. The League of Women Voters

02:04:27 11 Decision?

02:04:28 12 Q. Correct.

02:04:28 13 A. I have not commented on it.

02:04:30 14 Q. Okay.

02:04:32 15 That's your testimony? You

02:04:32 16 have not commented on it?

02:04:34 17 A. Yes.

02:04:34 18 Q. Okay.

02:04:35 19 Are you --- are you or have you

02:04:38 20 been a columnist for a publication

02:04:43 21 known as PA Townhall.com?

02:04:46 22 A. They've republished articles

02:04:49 23 that I've done in The Hill, so I don't

02:04:51 24 know if you would call it a columnist.

02:04:53 25 I write for The Hill and they

02:04:56 1 republish in PA Town Hall.

02:04:58 2 Q. So you agree with me you have  
02:04:59 3 had one or more articles published in  
02:05:02 4 PA Town Hall?

02:05:03 5 A. Yes.

02:05:04 6 Q. Was one of those an article  
02:05:06 7 published on February 14th, 2018,  
02:05:08 8 called Gerrymandering Merry-Go-Round?

02:05:13 9 A. I don't know of the date, but I  
02:05:16 10 have no reason to disbelieve you, and  
02:05:18 11 that sounds like something I've  
02:05:20 12 written.

02:05:20 13 Q. Do you remember writing an  
02:05:20 14 article called something like  
02:05:23 15 Gerrymandering Merry-Go-Round?

02:05:23 16 A. I remember writing an article  
02:05:25 17 about gerrymandering and talking about  
02:05:27 18 this overreliance on shapes and it's  
02:05:29 19 more important to think about  
02:05:31 20 interests.

02:05:31 21 Q. And if I represent to you that  
02:05:32 22 February 14th, 2018, was very shortly  
02:05:35 23 after the Supreme Court issued its  
02:05:40 24 first Decision in League of Women  
02:05:41 25 Voters, would you have any reason to

02:05:42 1 doubt me?

02:05:43 2 A. I have no reason to doubt you.

02:05:44 3 Q. Okay.

02:05:44 4 ATTORNEY WIYGUL:

02:05:47 5 Do we have that article?

02:05:48 6 Can we put it up, please?

02:05:48 7 BY ATTORNEY WIYGUL:

02:06:06 8 Q. Does this look familiar?

02:06:07 9 A. Yes.

02:06:07 10 Q. Okay.

02:06:09 11 Can we go to the last paragraph

02:06:09 12 of that article on page two. And if

02:06:09 13 it's easier, I believe I can give you

02:06:09 14 a copy of that article, sir. Would

02:06:11 15 you like a paper copy? Just let me

02:06:18 16 know. All right.

02:06:19 17 Do you see the last paragraph?

02:06:21 18 A. Do you mean that last sentence?

02:06:23 19 Q. Yes.

02:06:24 20 A. Yes.

02:06:24 21 Q. Those who shake their fists at

02:06:28 22 gerrymandering and clog the courts

02:06:28 23 with their lawsuits are really

02:06:37 24 announcing their own rigidity and

02:06:37 25 intellectual bankruptcy to the world.



02:06:37 1 Do you recall writing that sentence?

02:06:39 2 A. I mean, I don't recall it, but  
02:06:39 3 I'm sure I wrote it.

02:06:39 4 Q. The Supreme Court of  
02:06:42 5 Pennsylvania disagrees with you.

02:06:42 6 Correct?

02:06:42 7 A. If you represent that.

02:06:44 8 Q. Well, they believe that ---  
02:06:45 9 they ruled in that case that the 2011  
02:06:48 10 Pennsylvania enacted district plan was  
02:06:52 11 unlawful.

02:06:53 12 Correct?

02:06:53 13 ATTORNEY HAVERSTICK:

02:06:55 14 Your Honor, I object.

02:06:55 15 JUDGE McCULLOUGH:

02:06:55 16 Excuse me.

02:06:56 17 ATTORNEY HAVERSTICK:

02:06:56 18 Are we asking a  
02:06:57 19 nonlawyer about legal questions now?

02:06:59 20 I mean, I understand why he wants to

02:07:01 21 --- we've established --- he said over  
02:07:02 22 and over again I'm not a lawyer. How  
02:07:05 23 are we expecting him to parse out the  
02:07:09 24 League of Women Voters and ---.

02:07:09 25 JUDGE McCULLOUGH:

02:07:10 1 Mr. Wiygul?

02:07:11 2 ATTORNEY WIYGUL:

02:07:12 3 Your Honor, I think his  
02:07:12 4 awareness of what the Opinion said and  
02:07:14 5 whether his opinions are consistent  
02:07:16 6 with a decision that's controlling law  
02:07:18 7 in the state are absolutely relevant  
02:07:20 8 to the credibility and the weight that  
02:07:22 9 this Court should give ---.

02:07:23 10 JUDGE McCULLOUGH:

02:07:23 11 Well, I think he already  
02:07:25 12 told he didn't read the LWV, so I  
02:07:30 13 think you're asking about it ---  
02:07:31 14 asking him about it again. So I don't  
02:07:31 15 know where you're going with that, but  
02:07:34 16 you can ask him about the article.

02:07:34 17 BY ATTORNEY WIYGUL:

02:07:36 18 Q. Are you aware that the  
02:07:37 19 Pennsylvania Supreme Court --- putting  
02:07:37 20 aside any specifics about the  
02:07:38 21 Decision, are you aware that in that  
02:07:40 22 decision or in any decision the  
02:07:42 23 Pennsylvania Supreme Court has held  
02:07:44 24 that there are such things as  
02:07:46 25 unconstitutional gerrymanderers that

02:07:49 1 may require enacted congressional  
02:07:49 2 district maps to be invalidated?  
02:08:02 3 A. Could you repeat the question?  
02:08:03 4 Q. Sure. Are you aware that the  
02:08:05 5 Pennsylvania Supreme Court has held  
02:08:06 6 that at least one suit shaking its  
02:08:10 7 fist at gerrymandering was not  
02:08:12 8 clogging the court and was not a  
02:08:14 9 symptom of intellectual bankruptcy but  
02:08:18 10 stated a meritorious case for which  
02:08:20 11 the Court felt constrained to grant  
02:08:22 12 relief?  
02:08:23 13 A. I'm aware that the Court redrew  
02:08:27 14 the map and rejected the old map. I  
02:08:31 15 mean, that's what I'm aware of, and  
02:08:32 16 that they rejected the 2011 or 2012  
02:08:34 17 map, whichever --- whichever choice  
02:08:36 18 you want to make to call it.  
02:08:40 19 Q. And you see in the paragraph  
02:08:41 20 above the one we just read, the first  
02:08:43 21 sentence you wrote in the end there  
02:08:45 22 really is no proof that weird-looking  
02:08:49 23 congressional districts are inherently  
02:08:52 24 unjust?  
02:08:53 25 A. Yes.

02:08:53 1 Q. Do you see that?

02:08:53 2 A. Yes.

02:08:54 3 Q. Are you aware that in the  
02:08:54 4 League of Women Voters case the Court  
02:08:55 5 did focus on some of the extreme  
02:08:58 6 weirdness of the districts under the  
02:09:00 7 2011 plan and relied on that weirdness  
02:09:03 8 in part to conclude that that plan was  
02:09:05 9 unconstitutional?

02:09:06 10 A. I did not read the Opinion.

02:09:18 11 Q. I would like to talk a little  
02:09:20 12 bit about the problem of prediction  
02:09:20 13 that you raised in your article. Is  
02:09:22 14 it fair to say that is an important  
02:09:24 15 premise behind your conclusion that  
02:09:27 16 reliance on partisan fairness metrics  
02:09:30 17 is flawed?

02:09:31 18 A. Well, the problem with  
02:09:37 19 prediction is that statistical  
02:09:41 20 prediction and projection, all of it  
02:09:42 21 is based on the past. It's all based  
02:09:45 22 on the data that we already have. And  
02:09:47 23 any of these analyses is simply saying  
02:09:50 24 that a pattern will continue into the  
02:09:52 25 future and tries to project what

02:09:55 1 happens if we offer different  
02:09:56 2 treatment variables that would change  
02:09:58 3 it. And what happens --- it's sort of  
02:10:00 4 like the weather.  
02:10:00 5 Q. Sir, I'm going to ---.  
02:10:01 6 A. I'm sorry.  
02:10:02 7 Q. I wasn't asking for an  
02:10:05 8 explanation of that. I was just  
02:10:05 9 asking is it an important premise  
02:10:07 10 behind your conclusion that relying on  
02:10:10 11 partisan metrics in the redistricting  
02:10:15 12 context is misguided?  
02:10:16 13 A. You mean that projection is  
02:10:17 14 uncertain ---  
02:10:17 15 Q. Correct.  
02:10:18 16 A. --- and that there's like a  
02:10:19 17 high --- there can be a high standard  
02:10:20 18 deviation?  
02:10:21 19 Q. Correct.  
02:10:22 20 A. Yes.  
02:10:22 21 Q. Okay.  
02:10:23 22 But you'll agree with my that  
02:10:27 23 there's actual academic scholarship  
02:10:30 24 out there, extensive scholarship,  
02:10:33 25 peer-reviewed scholarship, that does

02:10:36 1 believe you can draw not perfect  
02:10:37 2 predictive conclusions but reliable  
02:10:41 3 predictive conclusions based on past  
02:10:43 4 election results?  
02:10:45 5 A. I think that one of the  
02:10:46 6 problems in this case ---.  
02:10:46 7 Q. Sir, my question is are you  
02:10:48 8 aware that that scholarship exists?  
02:10:51 9 A. What is ---?  
02:10:52 10 Q. Are you aware that scholarship  
02:10:54 11 exists?  
02:10:54 12 A. The scholarship of what?  
02:10:56 13 Q. That holds that you can, in  
02:10:57 14 fact, rely on the results of past  
02:10:59 15 elections to make reasonable  
02:11:01 16 predictions about future electoral  
02:11:06 17 patterns. You're aware there's  
02:11:10 18 peer-reviewed scholarships so holding?  
02:11:13 19 A. I'm trying to recall from my  
02:11:14 20 own dissertation if I've read that  
02:11:20 21 literature. I think I've read some of  
02:11:21 22 that literature at the time.  
02:11:22 23 Q. Yesterday's testimony by Dr.  
02:11:24 24 Rodden, by Dr. DeFord, by Dr. Duchin,  
02:11:28 25 they all referred to that literature.

02:11:30 1 Right?

02:11:30 2 A. I believe so.

02:11:31 3 Q. Okay.

02:11:31 4 And in fact, even the expert  
02:11:33 5 for the House Republicans in this  
02:11:35 6 case, he also said --- I'm  
02:11:38 7 paraphrasing because I don't have the  
02:11:40 8 transcript in front of me, but that  
02:11:42 9 either the political registration of a  
02:11:46 10 voter was either the best or one of  
02:11:48 11 the best ways of gauging how that  
02:11:49 12 voter would vote. Did you hear that  
02:11:51 13 testimony?

02:11:51 14 A. I did not hear his testimony.

02:11:53 15 Q. And in fact, the political  
02:11:54 16 parties in this country,  
02:11:55 17 non-parliamentary system, in this  
02:11:58 18 country, just like the scholars who  
02:12:00 19 are applying these methods in this  
02:12:02 20 country, not parliamentary systems,  
02:12:04 21 they believe you can use past election  
02:12:10 22 results to gauge future electoral  
02:12:13 23 patterns, don't they?

02:12:13 24 A. Past election results can  
02:12:15 25 provide that with a --- and sometimes

02:12:17 1 there's a significant variance in  
02:12:18 2 standard deviation which you have to  
02:12:19 3 keep in mind. So they don't provide  
02:12:21 4 exact predictions. And certainly  
02:12:26 5 those predictions over time become  
02:12:28 6 less reliable. So it's important to  
02:12:29 7 understand that we're doing ---.

02:12:29 8 Q. Sir, you're getting away from  
02:12:30 9 my question again.

02:12:30 10 A. I'm sorry.

02:12:32 11 Q. You will agree with me that the  
02:12:33 12 political parties in this country have  
02:12:35 13 reached that conclusion?

02:12:36 14 A. What was that?

02:12:37 15 Q. The conclusion that you can use  
02:12:38 16 past election results to predict  
02:12:40 17 future electoral patterns?

02:12:43 18 A. Not with absolute certainty,  
02:12:45 19 but it is helpful.

02:12:45 20 Q. I didn't ask you. Okay. Thank  
02:12:45 21 you.

02:12:45 22 ATTORNEY WIYGUL:

02:12:48 23 Can we go to the third  
02:12:51 24 paragraph in Dr. Naughton's article,  
02:12:57 25 please, first page?



02:12:57 1 BY ATTORNEY WIYGUL:

02:13:00 2 Q. Do you see there you wrote,  
02:13:01 3 second sentence, using past voting  
02:13:03 4 behavior and matching that behavior  
02:13:04 5 with demographics, each party develops  
02:13:04 6 their own pretty solid predicting  
02:13:04 7 model of electoral behavior.

02:13:09 8 Did I read that correctly?

02:13:10 9 A. Yes.

02:13:11 10 Q. All right. Thank you.

02:13:12 11 I would like to talk a little  
02:13:14 12 bit about communities of interest.

02:13:16 13 You really focus on the greater  
02:13:18 14 Philadelphia and Pittsburgh regions in  
02:13:20 15 your report.

02:13:20 16 Is that fair?

02:13:21 17 A. Mostly Pittsburgh, yes.

02:13:22 18 Q. Okay.

02:13:25 19 And you will agree with me that  
02:13:26 20 there are trade-offs among the  
02:13:28 21 traditional redistricting criteria and  
02:13:31 22 in particular between the number of  
02:13:33 23 split political subdivisions and  
02:13:36 24 compactness. I think you basically  
02:13:38 25 testified to that in your direct.

02:13:39 1 Right?

02:13:42 2 A. Yes, there are trade-offs. You  
02:13:43 3 have to make trade-offs.

02:13:44 4 Q. And you're not testifying that  
02:13:47 5 any map that keeps Pittsburgh whole is  
02:13:49 6 better than any map that splits  
02:13:52 7 Pittsburgh, are you?

02:13:53 8 A. Well, I believe I testified  
02:13:56 9 that the maps that are better match up  
02:13:58 10 the city with sort of the east and the  
02:14:03 11 Mon Valley, but I --- but I --- what  
02:14:05 12 was the question again?

02:14:06 13 Q. I'm asking you are not  
02:14:07 14 testifying that any map that keeps  
02:14:09 15 Pittsburgh whole in one district is  
02:14:11 16 better than any map that splits  
02:14:14 17 Pittsburgh? That's not your  
02:14:14 18 testimony.

02:14:16 19 Right?

02:14:17 20 A. I think in my expert report I  
02:14:19 21 had said that Pittsburgh should not be  
02:14:21 22 split and that would be --- I don't  
02:14:24 23 know if I used the phrase  
02:14:27 24 disqualifying factor, but ---.

02:14:27 25 Q. I'm just asking you right now

02:14:28 1 is it your testimony that any map that  
02:14:30 2 keeps Pittsburgh whole is better than  
02:14:32 3 any map that splits Pittsburgh?

02:14:34 4 A. Oh, yes, yes.

02:14:36 5 Q. It is. So any map that keeps  
02:14:38 6 Pittsburgh whole, no matter what else  
02:14:40 7 it does in the whole rest of the  
02:14:41 8 Commonwealth of Pennsylvania, is  
02:14:43 9 superior to any map that splits  
02:14:45 10 Pittsburgh, no matter what it does in  
02:14:48 11 all of the rest of the Commonwealth of  
02:14:50 12 Pennsylvania? That is your testimony?

02:14:51 13 A. Let me correct that because I  
02:14:53 14 gave you an incorrect answer. I  
02:14:54 15 should apologize for that. My  
02:14:59 16 testimony, my opinion, is that a map  
02:15:02 17 that splits Pittsburgh has significant  
02:15:04 18 problems and have significant demerits  
02:15:08 19 and it's unnecessary in western  
02:15:10 20 Pennsylvania.

02:15:11 21 ATTORNEY WIYGUL:

02:15:11 22 Your Honor, if I can  
02:15:12 23 just ask the Court's indulgence for  
02:15:12 24 another a minute or two in light of  
02:15:15 25 some of this?

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JUDGE McCULLOUGH:

Can we stop the clock?

I'm sorry, what?

ATTORNEY WIYGUL:

I was going to request another minute or 90 seconds in light of some of the longer answers.

JUDGE McCULLOUGH:

We stopped --- well, everyone has been giving long answers. I'll let you ask one more question and he can answer.

ATTORNEY WIYGUL:

Okay. Thank you.

BY ATTORNEY WIYGUL:

Q. Are you aware, did you hear the testimony that as part of the process of making of the Governor's map, the Governor set up a public portal where individuals and members of communities of interest in Pittsburgh and all over the State could actually offer their own opinion as opposed to your opinion about what's best for them and how the line should be divided?

02:15:56 1 A. I did not examine the  
02:15:59 2 Governor's process.  
02:16:00 3 Q. Did you ---?  
02:16:00 4 JUDGE McCULLOUGH:  
02:16:00 5 I said one question.  
02:16:03 6 ATTORNEY WIYGUL:  
02:16:03 7 Fair enough, Your Honor.  
02:16:05 8 Thank you.  
02:16:05 9 JUDGE McCULLOUGH:  
02:16:06 10 Thank you, Counsel. Now  
02:16:07 11 we move to counsel for the Republican  
02:16:13 12 Legislative Intervenors.  
02:16:13 13 ---  
02:16:13 14 CROSS EXAMINATION  
02:16:13 15 ---  
02:16:13 16 BY ATTORNEY LEWIS:  
02:16:34 17 Q. Good morning. Patrick Lewis on  
02:16:36 18 behalf of the Republican House  
02:16:39 19 Intervenors?  
02:16:39 20 A. Good morning.  
02:16:41 21 Q. Doctor, did I hear you  
02:16:42 22 correctly in your Direct Examination  
02:16:44 23 that, in your view, computer models do  
02:16:47 24 not take into account the specific  
02:16:49 25 factors of individual races?

02:16:54 1 A. Yes.

02:16:54 2 Q. So in your opinion as a  
02:16:56 3 political scientist has it been  
02:16:59 4 appropriate for the court to draw a  
02:17:01 5 plan or design a plan to specific  
02:17:07 6 partisan fairness metric score based  
02:17:09 7 on one of those computer models?

02:17:11 8 A. Could you repeat the question  
02:17:12 9 please?

02:17:13 10 Q. Sure. So in your opinion as a  
02:17:16 11 political scientist do you believe  
02:17:18 12 it's appropriate for the Court to  
02:17:20 13 select a map that was designed to  
02:17:22 14 achieve a specific partisan fairness  
02:17:25 15 score using a computer model?

02:17:28 16 ATTORNEY ATTISANO:

02:17:28 17 Objection Your Honor the  
02:17:29 18 senate Democratic caucus it calls for  
02:17:32 19 a legal conclusion and it doesn't call  
02:17:35 20 for a legal conclusion.

02:17:39 21 JUDGE McCULLOUGH:

02:17:39 22 Your response.

02:17:41 23 ATTORNEY LEWIS:

02:17:41 24 Sure, Your Honor. I've  
02:17:42 25 asked his opinion as a political

02:17:42 1 scientist. We've had political  
02:17:45 2 scientists and mathematicians for the  
02:17:46 3 past two days asking --- urging Your  
02:17:48 4 Honor to do precisely the question  
02:17:51 5 that I'm asking of this witness.

02:17:53 6 JUDGE McCULLOUGH:

02:17:53 7 Yes.

02:17:54 8 ATTORNEY ATTISANO:

02:17:54 9 Your Honor, if I may, he  
02:17:55 10 asked --- the question he asked is, is  
02:17:56 11 it appropriate for the Court to ---  
02:17:58 12 and that's asking for a legal  
02:18:00 13 conclusion.

02:18:00 14 JUDGE McCULLOUGH:

02:18:00 15 Okay.

02:18:01 16 Can you rephrase that  
02:18:02 17 part of your question?

02:18:04 18 ATTORNEY LEWIS:

02:18:04 19 Yes, Your Honor.

02:18:04 20 JUDGE McCULLOUGH:

02:18:05 21 Okay.

02:18:05 22 BY ATTORNEY LEWIS:

02:18:06 23 Q. All right.

02:18:07 24 Doctor, in your opinion, as a  
02:18:10 25 political scientist, is it appropriate

02:18:12 1 to draw a map that's designed to  
02:18:15 2 achieve a specific partisan fairness  
02:18:18 3 score using a computer model?

02:18:21 4 A. No.

02:18:21 5 Q. Now, you testified on Direct  
02:18:27 6 Examination that you believe it was  
02:18:28 7 appropriate to keep Pittsburgh in a  
02:18:30 8 single district.

02:18:31 9 Is that right?

02:18:32 10 A. Yes.

02:18:34 11 Q. Okay.

02:18:37 12 And is there a benefit to a  
02:18:39 13 city beyond just the partisan  
02:18:42 14 affiliation of its congressional  
02:18:46 15 representative to be kept in a single  
02:18:48 16 district?

02:18:48 17 A. Yes.

02:18:48 18 Q. Okay.

02:18:48 19 And what are some of those  
02:18:50 20 benefits?

02:18:51 21 A. Well, I think every political  
02:18:54 22 benefit --- every political unit by  
02:18:57 23 its very nature has interests.  
02:19:02 24 Federal funds flow through city  
02:19:05 25 governments, municipal governments,



02:19:08 1 federal funds flow through authority  
02:19:11 2 that are often based on those lines.  
02:19:13 3 Councils of government, other sorts of  
02:19:16 4 organizations, so having a --- having  
02:19:20 5 a municipality as a unit is helpful  
02:19:25 6 when you're looking at advocacy. It's  
02:19:28 7 helpful when you're looking at, will  
02:19:31 8 you get that service and that advocacy  
02:19:33 9 from the member of the Congress.

02:19:35 10 It's also helpful because you  
02:19:37 11 can have that specialization. You  
02:19:39 12 know, you're in a certain district  
02:19:40 13 that has got certain folks that, you  
02:19:44 14 know, a member develops a  
02:19:48 15 specialization constituent service, a  
02:19:48 16 member develop specialization, you  
02:19:52 17 know, selecting their committees and  
02:19:52 18 so forth. So keeping those  
02:19:55 19 communities together is vital and it's  
02:19:56 20 vitally important for --- you know,  
02:20:00 21 the acquisition of federal funds and  
02:20:01 22 for proper advocacy.

02:20:03 23 Q. And those would be benefits  
02:20:04 24 that would flow to the voters of such  
02:20:07 25 a city regardless of the political

02:20:10 1 affiliation of the member of Congress  
02:20:14 2 representing that city.

02:20:15 3 Is that right?

02:20:16 4 A. They would flow to all  
02:20:18 5 citizens, whether there are voters or  
02:20:20 6 not voters.

02:20:21 7 Q. I just have a few questions for  
02:20:22 8 you about House Bill 2146.

02:20:34 9 Are you familiar with that  
02:20:35 10 plan?

02:20:35 11 A. I reviewed them. I looked at  
02:20:37 12 the maps.

02:20:45 13 Q. And I will represent to you,  
02:20:46 14 Doctor, that this is a rendering of  
02:20:49 15 House Bill 2146, and it is attached as  
02:20:52 16 Exhibit 1 to the Affidavit of Bill  
02:21:02 17 Shaller, which is Exhibit I to our  
02:21:04 18 opening report.

02:21:04 19 I would like to first start  
02:21:09 20 with the Pittsburgh area district, so  
02:21:11 21 I'm going to zoom in. If you need to  
02:21:15 22 flip to a view that has the Pittsburgh  
02:21:16 23 District let me know.

02:21:18 24 All right.

02:21:25 25 Now, this District 15 contains

02:21:27 1 the entire City of Pittsburgh.

02:21:32 2 Is that fair?

02:21:32 3 A. Yes, it appears so.

02:21:33 4 Q. And does this configuration of  
02:21:36 5 Allegheny County --- I believe  
02:21:37 6 District 17 contains the balance of  
02:21:39 7 Allegheny County?

02:21:41 8 A. Yes.

02:21:45 9 Q. Based on your analysis, does  
02:21:48 10 this configuration, you know, honor  
02:21:52 11 the communities of interest in  
02:21:53 12 Allegheny County that you've testified  
02:21:56 13 about today?

02:21:58 14 A. Yes.

02:22:00 15 Q. Okay.

02:22:04 16 Now, I'm going to move east.  
02:22:11 17 So we will start here with our  
02:22:17 18 District 1 in this plan.

02:22:20 19 Does District 1 in the House  
02:22:24 20 Bill 2146 plan keep Bucks County  
02:22:27 21 whole?

02:22:30 22 A. Yes.

02:22:31 23 Q. And in your view, does District  
02:22:33 24 1 fairly honor the communities of  
02:22:35 25 interest of Bucks County?

02:22:36 1 A. In my opinion, yes.

02:22:38 2 Q. Here I'm going to Zoom a little  
02:22:48 3 bit in. We're going to look at  
02:22:49 4 Philadelphia.

02:22:53 5 Okay.

02:22:53 6 Now, Professor, this --- or  
02:22:56 7 Doctor, I should say, this particular  
02:22:57 8 plan, is it fair to say Districts 2  
02:23:00 9 and 3 in this plan are contained  
02:23:02 10 within Philadelphia?

02:23:04 11 A. Yes.

02:23:05 12 Q. Okay.

02:23:05 13 In your opinion, is that  
02:23:08 14 consistent with the communities of  
02:23:10 15 interest in Philadelphia?

02:23:14 16 A. I don't think I can offer an  
02:23:15 17 opinion on the specifics within the  
02:23:17 18 City of Philadelphia, but I believe it  
02:23:19 19 is in the interest for the City to  
02:23:21 20 have two districts contained entirely  
02:23:25 21 within it.

02:23:27 22 Q. And I believe in your report  
02:23:28 23 you discussed having overflow  
02:23:30 24 population from Philadelphia go into  
02:23:32 25 Delaware County.

02:23:33 1 Is that correct?

02:23:35 2 A. Yes.

02:23:35 3 Q. All right.

02:23:36 4 And District 5 in House Bill  
02:23:40 5 2146 does precisely that.

02:23:42 6 Is that correct?

02:23:43 7 A. Yes.

02:23:46 8 ATTORNEY LEWIS:

02:23:47 9 I have no further  
02:23:47 10 questions. Thank you.

02:23:47 11 THE WITNESS:

02:23:49 12 Thank you.

02:23:49 13 JUDGE McCULLOUGH:

02:23:49 14 Thank you, counsel.

02:23:54 15 Counsel for Republican Democratic  
02:23:58 16 Intervenor. I'm sorry, Democratic  
02:24:04 17 House Intervenor.

02:24:04 18 ATTORNEY SENOFF:

02:24:05 19 Thank you, Your Honor.

02:24:23 20 Your Honor, I have my  
02:24:24 21 computer and a lot of papers, but I am  
02:24:26 22 really going to try to be short.

02:24:27 23 JUDGE McCULLOUGH:

02:24:27 24 You get 15 minutes.

02:24:27 25 THE WITNESS:

02:24:29 1 Good morning.

02:24:29 2 ---

02:24:29 3 CROSS EXAMINATION

02:24:30 4 ---

02:24:30 5 BY ATTORNEY SENOFF:

02:24:30 6 Q. Good morning, Doctor. What I  
02:24:32 7 said to your counsel earlier I really  
02:24:35 8 thought you and I were going to have  
02:24:37 9 much more disagreements than ---  
02:24:38 10 personally, anyway, than I think that  
02:24:39 11 we do. You may use a different word,  
02:24:42 12 which I won't put on the record.

02:24:45 13 Can you just as a point of  
02:24:47 14 clarification, with regard to  
02:24:51 15 Pennsylvanians voter registration,  
02:24:53 16 just globally, not looking at any  
02:24:55 17 partisan registration, but total  
02:24:59 18 number, do we know --- I mean, if I  
02:25:00 19 represent to you that there are more  
02:25:02 20 registered voters now than there were  
02:25:05 21 in 2011, would that comport with  
02:25:07 22 your ---?

02:25:08 23 A. I would not disagree with that.  
02:25:10 24 I don't know the magnitude, but I  
02:25:12 25 would not disagree with you on that.

02:25:13 1 Q. And have you read or studied  
02:25:17 2 any reports about why it is that  
02:25:19 3 Pennsylvania actually lost its seat in  
02:25:21 4 the House of Representatives?  
02:25:25 5 A. Have I read any specific  
02:25:26 6 reports?  
02:25:26 7 Q. Yeah, or articles. Or have you  
02:25:28 8 looked at the reasons why?  
02:25:31 9 A. I mean, I may have. It's hard  
02:25:35 10 to say.  
02:25:35 11 Q. Do you have a general idea of  
02:25:38 12 why that occurred?  
02:25:39 13 A. Well, Pennsylvania's population  
02:25:48 14 has grown at a slower rate than the  
02:25:54 15 nation as a whole, which has been  
02:25:54 16 happening for -- you know, for quite  
02:25:54 17 some time. And as a result it has to  
02:25:57 18 lose a seat.  
02:25:57 19 Q. Even though there's more ---?  
02:25:59 20 A. Even though there's more people  
02:25:59 21 yes. Yeah, California is bigger but  
02:26:02 22 they're going to --- I think they ---  
02:26:04 23 I think they're losing a seat. I  
02:26:05 24 don't want to misrepresent anything.  
02:26:08 25 But yes.

02:26:08 1 Q. Okay.

02:26:08 2 I appreciate that.

02:26:08 3 A. You don't have to lose

02:26:12 4 population to lose a seat.

02:26:13 5 Q. I appreciate that. Thank you.

02:26:16 6 So in talking about Bucks

02:26:18 7 County and Philadelphia I was happy to

02:26:21 8 hear you say you could see the

02:26:23 9 difference when you go from

02:26:24 10 Philadelphia to Bensalem, because I

02:26:26 11 grew up in the far northeast, and I

02:26:29 12 could never tell the difference when I

02:26:32 13 started driving. And I want to ask

02:26:33 14 you just hypothetically whether

02:26:37 15 there's a difference in your mind

02:26:39 16 between keeping Bucks County together

02:26:42 17 or slicing off the far northeast and

02:26:45 18 putting it into Bucks County?

02:26:47 19 A. You mean the far northeast of

02:26:49 20 the City.

02:26:50 21 Q. Of Philadelphia, the City of

02:26:51 22 Philadelphia. You know, and I'm

02:26:55 23 talking about the part that borders

02:26:56 24 Philadelphia --- a part of

02:26:58 25 Philadelphia that borders Bucks,



02:27:00 1 Montgomery --- you know, there's that  
02:27:02 2 area they refer to as Philmont, I  
02:27:04 3 think it might border --- it's like  
02:27:06 4 the intersection of three counties.  
02:27:09 5 A. I'm not good on the city  
02:27:10 6 neighborhoods. I apologize.  
02:27:13 7 Q. That's okay. But would you  
02:27:15 8 take -- you know, when you said, like,  
02:27:16 9 oh, you know, the northeast is  
02:27:18 10 different than Bensalem, is that just  
02:27:22 11 because they're more closely aligned  
02:27:24 12 to the city interests or could the  
02:27:27 13 residents of the northeast be equally  
02:27:29 14 represented by somebody whose district  
02:27:33 15 was primarily in Bucks County?  
02:27:37 16 A. I think it depends on how much  
02:27:38 17 of the northeast you attach to Bucks  
02:27:43 18 County. It's kind of a numbers game.  
02:27:44 19 You know, the smaller the grouping the  
02:27:46 20 more likely they are to be --- I think  
02:27:48 21 I called them orphans in my report.  
02:27:52 22 So I think it would be --- I think ---  
02:27:54 23 as I think it would not be in the  
02:27:56 24 interest of a portion of Bucks County  
02:27:58 25 to be attached to a city district, I

02:28:02 1 think it would not be advisable --- or  
02:28:06 2 I wouldn't recommend attaching too  
02:28:08 3 much of the northeast to Bucks. I  
02:28:11 4 don't think it would be in their  
02:28:13 5 interests.

02:28:14 6 Q. Okay.

02:28:16 7 Now, were you here yesterday to  
02:28:21 8 see the expert testimony of the last  
02:28:25 9 expert who testified whose name is now  
02:28:29 10 escaping me?

02:28:29 11 A. Is it Barber?

02:28:30 12 Q. Barber.

02:28:31 13 A. I did not see his testimony.

02:28:33 14 Q. Okay.

02:28:35 15 Did you read Dr. Barber's  
02:28:36 16 report?

02:28:37 17 A. No.

02:28:38 18 Q. If I represented to you ---  
02:28:41 19 well, did you review the map that Dr.  
02:28:44 20 Barber reviewed?

02:28:46 21 A. What map was that?

02:28:48 22 Q. I believe he reviewed --- well,  
02:28:51 23 he reviewed all of the maps, but ---.

02:28:54 24 A. Yeah, I looked at them.

02:28:56 25 Q. Okay.

02:28:57 1 Now, I'm going to get this  
02:28:59 2 wrong, but I'm paraphrasing his  
02:29:01 3 testimony.

02:29:01 4 A. Sure.

02:29:01 5 Q. But one of Dr. Barber's  
02:29:04 6 theories was that his map or the map  
02:29:08 7 that he was testifying on behalf was  
02:29:10 8 better, because it was randomly  
02:29:13 9 created. In other words, it was race  
02:29:16 10 blind, it was partisan blind, it met  
02:29:24 11 the criteria of contiguousness and  
02:29:28 12 population density and what people  
02:29:30 13 have referred to here as the big six  
02:29:33 14 factors went to consider metrics, went  
02:29:36 15 to consider and came up with these  
02:29:38 16 maps.

02:29:39 17 Now, in your opinion is that  
02:29:41 18 the best way to create a map? A  
02:29:47 19 redistricted map I should say. I'm  
02:29:50 20 not talking maps of --- like, of the  
02:29:52 21 highway system?

02:29:56 22 A. I have to say randomization is  
23 a powerful tool to get  
24 representativeness we --- we have to  
25 use it in polling. For example, you

1 have to use --- if it's not a  
2 randomized poll, it is worthless.  
3 It's a selective sample.

02:30:07 4 So I would say you could  
02:30:09 5 justify randomization as a helpful  
02:30:13 6 tool, but I don't think --- I would  
02:30:15 7 disagree that it should be the only  
02:30:17 8 tool. I think it would be a  
02:30:19 9 worthwhile contributory tool.

02:30:25 10 Q. Okay.

02:30:25 11 I think we agree on that. Just  
02:30:28 12 because I don't want to go over my  
02:30:29 13 time, let me --- I'm going to switch  
02:30:31 14 gears here.

02:30:31 15 A. Sure. Sure.

02:30:32 16 Q. Violently sometimes, and I  
02:30:35 17 apologize for that. But you testified  
02:30:37 18 earlier that you're not a lawyer, and  
02:30:39 19 you didn't read the League of Women  
02:30:41 20 Voters case.

02:30:44 21 Right?

02:30:45 22 A. Yes.

02:30:45 23 Q. You're not here telling us  
02:30:46 24 whether a particular map passes any  
02:30:48 25 kind of constitutional scrutiny or

02:30:51 1 anything like that in a  
02:30:51 2 technical/legal sense?  
02:30:56 3 A. Yes.  
02:30:56 4 Q. And you would agree with me  
02:30:58 5 that the job reports to do --- to pass  
02:31:02 6 that judgment?  
02:31:02 7 A. Yes. Yes, of course. Of  
02:31:03 8 course.  
02:31:03 9 Q. And you're here to try and help  
02:31:05 10 the Court essentially pick one of  
02:31:12 11 these maps?  
02:31:13 12 A. I'm here to provide --- I'm  
02:31:13 13 sorry for talking over you. I'm here  
02:31:14 14 to provide my expert opinions as  
02:31:16 15 admitted by the Court.  
02:31:17 16 Q. So were you here --- you know,  
02:31:19 17 I sound like a broken record, but I  
02:31:22 18 asked almost every expert if they  
02:31:25 19 considered, initially, the voter  
02:31:29 20 registration data of the citizens of  
02:31:34 21 the Commonwealth of Pennsylvania when  
02:31:36 22 they considered drawing their maps.  
02:31:40 23 Do you remember hearing that?  
02:31:41 24 A. I mean, I watched most of the  
02:31:43 25 testimony. I can't represent to

02:31:45 1 having like --- I don't have a  
02:31:47 2 photographic memory, but I wouldn't  
02:31:49 3 disagree with your characterization.  
02:31:51 4 I have no reason to.  
02:31:52 5 Q. And do you agree --- having  
02:31:53 6 reviewed what you reviewed that ---  
02:31:56 7 and heard what you heard --- that the  
02:31:59 8 maps that have been presented all fall  
02:32:03 9 within a --- what I'll call is not  
02:32:07 10 mathematical or scientific, but a  
02:32:09 11 reasonable range when you measure them  
02:32:13 12 based on those six metrics?  
02:32:15 13 A. What were the six metrics?  
02:32:17 14 Q. Now, you're going to test my  
02:32:19 15 memory.  
02:32:19 16 A. I'm sorry.  
02:32:20 17 Q. But you know, like population  
02:32:21 18 density, compactness, contiguousness.  
02:32:31 19 Now, I've got three.  
02:32:31 20 A. Yeah.  
02:32:32 21 Q. But in other words, these maps  
02:32:32 22 were not on those mathematical  
02:32:35 23 metrics, tremendous --- tremendously  
02:32:37 24 far apart from one another.  
02:32:39 25 A. I don't know if I can say that,

02:32:41 1 because you mentioned density ---  
02:32:47 2 population density, and necessarily in  
02:32:48 3 the middle of the state you're going  
02:32:50 4 to have low density. I mean it's such  
02:32:55 5 a diverse state --- it's very  
02:32:55 6 challenging to draw the map.  
02:32:57 7 Q. I agree with you on that. I  
02:32:58 8 just mean, all the maps fell within a  
02:33:01 9 certain, say, standard deviation. And  
02:33:02 10 again, I'm not using that in any  
02:33:03 11 mathematical ---  
02:33:03 12 A. Yeah, I wouldn't ---. Yeah.  
02:33:03 13 Right.  
02:33:04 14 Q. --- sense. But they're pretty  
02:33:05 15 close together is all I'm saying on  
02:33:07 16 those metrics that they were asked to  
02:33:11 17 review. The objective metrics is what  
02:33:13 18 I will call them.  
02:33:14 19 A. Again, I don't think I can  
02:33:16 20 represent that until I really --- you  
02:33:20 21 know, if I looked at all six metrics  
02:33:23 22 --- and I don't want to incorrectly  
02:33:24 23 represent my opinion.  
02:33:24 24 Q. I appreciate your concern, and  
02:33:26 25 I thank you for that candor.

02:33:28 1 A. I apologize for that.

02:33:30 2 Q. But let me ask you this, if I  
02:33:32 3 represented to you that hypothetically  
02:33:34 4 they're all within a spectrum and  
02:33:36 5 they're very close together in terms  
02:33:38 6 of differences on these mathematical  
02:33:40 7 metrics; right, and so, for example,  
02:33:44 8 one map is not so wildly outrageous  
02:33:48 9 that we can just say, you know, that's  
02:33:50 10 way too out there on all these  
02:33:52 11 metrics, there has to be a way for the  
02:33:57 12 Court to decide which one to go with.

02:33:59 13 Right?

02:34:00 14 A. I'd like to accommodate you,  
02:34:02 15 but I cannot accept your statement  
02:34:05 16 that the maps are relatively close,  
02:34:09 17 unless I were to actually look at the  
02:34:13 18 metrics and look into detail for that,  
02:34:15 19 so I'm sorry I can't accept that  
02:34:18 20 premise.

02:34:18 21 Q. Fair enough. Let me ask it a  
02:34:20 22 different way.

02:34:20 23 A. Yeah.

02:34:21 24 Q. Do you agree that if all of the  
02:34:24 25 objective standards are similar and



02:34:26 1 they're not determinative on their  
02:34:29 2 own, that some subjective standard ---  
02:34:32 3 some subjective criteria has to be put  
02:34:35 4 on top of those objective criteria in  
02:34:37 5 order to make a decision.

02:34:41 6 And again, I'm not asking about  
02:34:41 7 this.

02:34:41 8 A. Yeah.

02:34:42 9 Q. I'm just saying hypothetically  
02:34:44 10 if all the objective data for all the  
02:34:47 11 maps is exactly the same, do you agree  
02:34:50 12 that in order to pick one, you have to  
02:34:53 13 use some kind of subjective data?

02:34:56 14 A. Okay.

02:34:57 15 Let me get to where I think you  
02:34:59 16 want me to go, but let me just  
02:35:00 17 establish this first. You said if  
02:35:03 18 they're all the same they'll never be  
02:35:05 19 all the same, I think we would agree.

02:35:07 20 Q. I mean ---.

02:35:08 21 A. In fact, given this state  
02:35:09 22 there's going to be significant  
02:35:11 23 variance. I mean, as Philadelphia  
02:35:13 24 city district is going to have huge  
02:35:16 25 differences between the district in

02:35:18 1 the North Central portion, for  
02:35:20 2 example. And there's nothing we can  
02:35:22 3 do about it. There's nothing we can  
02:35:24 4 do about it.

02:35:26 5 But I would say that I agree  
02:35:27 6 that it's necessary to apply  
02:35:30 7 subjective standards, because it's not  
02:35:33 8 possible to satisfy all the objective  
02:35:36 9 standards. And they present a really  
02:35:39 10 incomplete picture. It's just not  
02:35:41 11 appropriate.

02:35:41 12 Q. Okay.

02:35:41 13 So ---?

02:35:44 14 A. You have to include --- yeah, I  
02:35:44 15 agree with you absolutely. You have  
02:35:46 16 to got to include subjectivity.  
02:35:48 17 There's no way to get out of it in  
02:35:51 18 politics. Politics is a subjective  
02:35:54 19 practice.

02:35:54 20 Q. So once you answered --- I was  
02:35:56 21 trying to get you there and I am not  
02:35:59 22 as smart as you are, and I couldn't  
02:36:02 23 figure how to do that, so I thank you  
02:36:04 24 for that.

02:36:04 25 So if we all agree --- or if

02:36:06 1 you and I at least agree that there is  
02:36:08 2 some subjective standards, can we  
02:36:13 3 agree that incumbency is a subjective  
02:36:16 4 standard that some people might find  
02:36:19 5 the protection of incumbency some  
02:36:21 6 people find important as a subjective  
02:36:22 7 standard?

02:36:23 8 A. Well, actually I think  
02:36:25 9 incumbency could be considered an  
02:36:28 10 objective standard, because it's sort  
02:36:34 11 of a binary thing. It's yes or no  
02:36:36 12 that you have an incumbent. But  
02:36:38 13 interesting that you brought that up,  
02:36:39 14 because I would answer does incumbency  
02:36:45 15 matter, and the answer is sort of.

02:36:48 16 Because if you've got members  
02:36:51 17 that are subcommittee chairs,  
02:36:53 18 committee chairs, they --- I mean, you  
02:36:55 19 got to keep those, you know. Everyone  
02:36:56 20 wants to hang on the ---.

02:36:56 21 Q. So let me just cut you off.

02:36:58 22 A. I'm sorry, lesser seniority,  
02:37:00 23 lesser important.

02:37:00 24 Q. Okay.

02:37:00 25 I'm running out of time.

02:37:01 1 A. Incumbency is less important if  
02:37:04 2 you got lesser seniority.

02:37:05 3 Q. And would another subjective  
02:37:06 4 factor be voter partisanship like the  
02:37:12 5 party that somebody's registered with?  
02:37:16 6 Could that be used as a subjective  
02:37:17 7 factor? Even though I understand the  
02:37:19 8 count is objective.

02:37:20 9 A. Yeah.

02:37:21 10 Q. But could you overlay that onto  
02:37:23 11 a map that was designed based solely  
02:37:26 12 on statistical modeling?

02:37:28 13 A. In Pennsylvania, I think it  
02:37:30 14 depends on what part of the state,  
02:37:32 15 because voter registration is --- it's  
02:37:40 16 attenuated on how you win sort of at  
02:37:41 17 the margin. Like, you got your blocks  
02:37:44 18 who vote straight party, and that's a  
02:37:46 19 key thing. So voter registration  
02:37:48 20 matters, but it matters less in that  
02:37:50 21 margin, in that swing voter.

02:37:52 22 Q. I understand. And you're  
02:37:53 23 talking about --- you're talking about  
02:37:56 24 like an outcome?

02:37:57 25 A. Yes. And I think we got to

02:37:57 1 think about ---.

02:37:57 2 Q. And I'm talking about --- I'm

02:38:00 3 talking about would you want to offer

02:38:05 4 lay the number of --- after the lines

02:38:07 5 are drawn, would you want to know,

02:38:08 6 hey, how many Republicans and how many

02:38:10 7 Democrats are within a particular

02:38:15 8 district. Is that information that

02:38:15 9 you would find helpful?

02:38:16 10 A. Yes, it should be part of it.

02:38:19 11 Not necessarily drive it, but it

02:38:20 12 should be part of it.

02:38:21 13 Q. And certainly I'm not

02:38:23 14 suggesting that any of these factors

02:38:25 15 should drive it, just that they should

02:38:26 16 be considered, that's all?

02:38:28 17 A. More information is better.

02:38:29 18 It's a matter of how you weight it.

02:38:31 19 Q. And I assume you agree with

02:38:33 20 that statement with regard to the

02:38:36 21 racial makeup of a particular

02:38:38 22 district, again, just a factor to

02:38:42 23 consider not make or break, but you

02:38:43 24 want to consider that or communities

02:38:45 25 of interests.

02:38:47 1 Is that a fair statement?

02:38:48 2 A. I don't want to --- I don't

02:38:50 3 want to break a mistake of going

02:38:51 4 outside of my bounds, but I think it's

02:38:54 5 a requirement; isn't it?

02:38:57 6 Q. I think --.

02:38:57 7 A. So I think the answer is

02:38:59 8 ethnicity.

02:38:59 9 Q. Ethnicity, yes.

02:39:01 10 A. Ethnicity is a factor that you

02:39:04 11 should consider in the proper context.

02:39:06 12 Q. And generally, when people talk

02:39:10 13 about the dilution of a vote, do you

02:39:13 14 have an understanding or what does

02:39:16 15 that mean to you? Or the dilution of

02:39:23 16 the power of a vote?

02:39:26 17 A. Pardon me.

02:39:26 18 Q. The dilution of the power of

02:39:30 19 one vote versus another?

02:39:33 20 A. Yes. I think we're on the same

02:39:34 21 page.

02:39:34 22 Q. And so is making sure that one

02:39:36 23 person's vote is as powerful vote as

02:39:39 24 another person's vote also one of

02:39:40 25 these subjective factors that we ---

02:39:44 1 that you might want to use --- again,  
02:39:46 2 not the sole factor, but one of the  
02:39:48 3 factors to consider?

02:39:53 4 A. Could you repeat the question,  
02:39:54 5 I'm sorry.

02:39:55 6 Q. Yes. Sure. Is the fact that  
02:39:57 7 you're trying to make sure that  
02:40:01 8 everybody's vote to the extent  
02:40:03 9 possible counts for one vote, not less  
02:40:06 10 than one vote, not more than one vote,  
02:40:08 11 but one vote. In other words, you  
02:40:10 12 don't want to dilute the vote, is that  
02:40:12 13 a factor that you would consider in  
02:40:16 14 one of these factors when you're  
02:40:18 15 deciding how to make the map?

02:40:23 16 A. I have to tell you I'm not sure  
02:40:24 17 how to answer that question.

02:40:31 18 JUDGE McCULLOUGH:

02:40:31 19 I don't want to cut you  
02:40:32 20 off if you don't answer, but you are  
02:40:36 21 now admitted over your time, Counsel.

02:40:38 22 ATTORNEY SENOFF:

02:40:40 23 I have so much credit in  
02:40:41 24 the bank, Your Honor.

02:40:42 25 JUDGE McCULLOUGH:

02:40:42

1

I think you got an

02:40:45

2

answer there.

02:40:45

3

ATTORNEY SENOFF:

4

Your Honor, I feel like

5

I have so much credit in the bank.

6

JUDGE MCCULLOUGH:

7

Credit?

8

ATTORNEY SENOFF:

02:40:46

9

From yesterday.

02:40:46

10

JUDGE MCCULLOUGH:

02:40:47

11

You shouldn't have given

02:40:48

12

it up.

02:40:49

13

ATTORNEY SENOFF:

02:40:49

14

Thank you, Your Honor.

02:40:50

15

JUDGE MCCULLOUGH:

02:41:00

16

Now we have the senate

02:41:01

17

Democrat intervenors.

02:41:01

18

---

02:41:01

19

CROSS EXAMINATION

02:41:30

20

---

02:41:30

21

BY ATTORNEY ATTISANO:

02:41:30

22

Q. Good morning still.

02:41:31

23

A. Good morning.

02:41:32

24

Q. Did you consider vote dilution

02:41:33

25

as part of your analysis in reaching



02:41:34 1 your conclusions here today?

02:41:36 2 A. Vote dilution as defined as?

02:41:37 3 Q. Your understanding of that  
02:41:38 4 term. Please go ahead and explain  
02:41:39 5 what you understand vote dilution to  
02:41:43 6 be.

02:41:43 7 A. Well, I would understand it as  
02:41:47 8 whether or not, you know, a voter is  
02:41:52 9 --- you know, has the sufficient power  
02:41:54 10 of the vote, whether that voter is  
02:41:57 11 able to exercise it and whether they  
02:42:02 12 have influence.

02:42:02 13 Q. Did you consider vote dilution  
02:42:06 14 in your analysis to reach the  
02:42:07 15 conclusions you reached here today?

02:42:10 16 A. No.

02:42:10 17 Q. And you were asked earlier  
02:42:15 18 about methodology. And feel free to  
02:42:17 19 disagree if I'm mischaracterizing what  
02:42:19 20 you said. My belief was you said  
02:42:23 21 something to the extent of I rely on  
02:42:25 22 my experience. Is that fair or is  
02:42:28 23 there additional methodology that you  
02:42:30 24 used in addition to your experience?

02:42:50 25 A. I want to try to answer this

02:42:50 1 correctly. What was the question  
02:42:50 2 again?  
02:42:53 3 Q. You were asked earlier if you  
02:42:57 4 used some kind of methodology to  
02:42:57 5 assist you in reaching your  
02:42:58 6 conclusions in your report. You  
02:42:59 7 answered to that, no, I used my  
02:43:01 8 experience. Is that fair? You based  
02:43:02 9 your conclusions in the report on your  
02:43:04 10 experience, correct, your experience  
02:43:06 11 and education?  
02:43:07 12 A. Yes.  
02:43:07 13 Q. Okay.  
02:43:10 14 And you agree that your  
02:43:12 15 experience has been helping Republican  
02:43:14 16 candidates win elected office? You  
02:43:16 17 started out by saying I think it was  
02:43:19 18 got to win to eat.  
02:43:23 19 Right?  
02:43:24 20 A. Yes. Yes, I did say that.  
02:43:25 21 Q. So you would agree that your  
02:43:29 22 area of expertise is most specifically  
02:43:31 23 in helping Republican candidates win  
02:43:42 24 office, specific ---?  
02:43:42 25 A. No.

02:43:42 1 Q. Are you not an expert in  
02:43:44 2 helping Republican candidates win  
02:43:46 3 office?

02:43:46 4 A. I think the way I put it is my  
02:43:49 5 experience is working on campaigns,  
02:43:52 6 helping individuals to get elected.  
02:43:55 7 Maybe I shouldn't have agreed with  
02:43:57 8 you. Yeah. Could you repeat the  
02:43:58 9 question?

02:43:58 10 Q. I'm sorry. When you help these  
02:44:00 11 individuals get elected, they're  
02:44:02 12 members of the Republican party.

02:44:05 13 Correct?

02:44:05 14 A. Yes.

02:44:06 15 Q. So another way to say what  
02:44:07 16 you're saying would be my experience  
02:44:08 17 and expertise is in helping members of  
02:44:11 18 the Republican party rather than just  
02:44:13 19 individuals get elected to public  
02:44:15 20 office. You agree with that.

02:44:16 21 Right?

02:44:17 22 A. When I was working on  
02:44:18 23 campaigns, yes.

02:44:23 24 Q. And with respect to review, the  
02:44:36 25 review of some materials that you

02:44:38 1 reviewed in this case you are familiar  
02:44:40 2 with the 2011 congressional map in  
02:44:45 3 Pennsylvania.

02:44:45 4 Correct?

02:44:46 5 I can refresh your recollection  
02:44:48 6 if you don't remember it.

02:44:49 7 A. I mean I don't like the word  
02:44:51 8 familiar.

02:44:52 9 Q. Let me just rephrase. You know  
02:44:54 10 it exists.

02:44:55 11 Right?

02:44:55 12 A. Oh, yes, I know it exists.

02:44:59 13 Q. Perfect. And you also know  
02:45:01 14 that in 2012 and 2014 and 2016 it  
02:45:03 15 yielded a proportional representation  
02:45:06 16 of 13 members of Congress from  
02:45:11 17 Pennsylvania and five Democratic  
02:45:13 18 members of Congress from Pennsylvania.  
02:45:15 19 You know that obviously.

02:45:16 20 Correct?

02:45:17 21 A. Well, I will accept your  
02:45:18 22 representation. I know that there was  
02:45:21 23 a Republican majority. I will accept  
02:45:23 24 your representation of 13/5.

02:45:26 25 Q. And earlier you talked about

02:45:28 1 how there are different political  
02:45:31 2 factors that can affect the outcome of  
02:45:34 3 elections obviously. You agree with  
02:45:36 4 that.

02:45:36 5 Correct?

02:45:37 6 A. Yes.

02:45:37 7 Q. Okay.

02:45:38 8 And in 2012, 2014 and 2016, the  
02:45:43 9 most significant factor that  
02:45:48 10 influenced the outcome of a 13  
02:45:50 11 Republicans to 5 Democratic split was  
02:45:52 12 the gerrymandering congressional map.  
02:45:56 13 Do you agree with that or disagree  
02:45:57 14 with that?

02:45:58 15 A. I can't offer an opinion on it.

02:45:59 16 Q. You talked about some of the  
02:46:12 17 analysis in your opinion, and correct  
02:46:20 18 me if I'm wrong here, was lacking to a  
02:46:21 19 certain degree because it relies on  
02:46:24 20 vote history and only --- let me  
02:46:29 21 rephrase that.

02:46:30 22 A. Yeah. Yeah.

02:46:30 23 Q. You were critical of some of  
02:46:33 24 the analysis that was presented by  
02:46:35 25 other experts because it relies on

02:46:37 1 vote history and it doesn't rely on  
02:46:39 2 these additional factors that you  
02:46:42 3 listed that can affect the outcome of  
02:46:44 4 an election.

02:46:44 5 Correct?

02:46:45 6 A. I think that is a  
02:46:46 7 mischaracterization of my opinion. If  
02:46:48 8 you would permit me to explain?

02:46:52 9 Q. Please.

02:46:53 10 A. I think the best way to say ---  
02:46:55 11 I am not criticizing their models and  
02:46:57 12 their math and their intellectual  
02:47:07 13 integrity and stuff. I am not  
02:47:09 14 criticizing that at all.

02:47:09 15 Q. And I wasn't trying to put that  
02:47:09 16 in your mouth.

02:47:11 17 A. My criticism of the models is  
02:47:13 18 they fail to inform the Court of the  
02:47:13 19 power of those models in the context  
02:47:18 20 of what we know are many, many other  
02:47:20 21 factors that will --- that influence  
02:47:21 22 the eventual outcome, number one. And  
02:47:25 23 number two, that over time prediction  
02:47:28 24 becomes less certain. So as we move  
02:47:31 25 forward over time, we get to 2028, it

02:47:36 1 is likely, not certain, but it is  
02:47:38 2 likely that any predictive model is  
02:47:38 3 going to degrade perhaps  
02:47:48 4 significantly.

02:47:48 5 Q. And are you familiar with Plan  
02:47:51 6 Score?

02:47:51 7 A. I've only seen it referred to,  
02:47:54 8 so no.

02:47:54 9 Q. Okay.

02:47:55 10 And you reviewed the report  
02:47:59 11 from Pittsburgh City Controller  
02:48:01 12 Michael Lamb, which has been attached  
02:48:03 13 as an exhibit to the Senate Democrats  
02:48:06 14 brief entitled the Lamb Report. You  
02:48:09 15 reviewed that.

02:48:09 16 Correct?

02:48:10 17 A. Yes.

02:48:10 18 Q. You also relied on it in  
02:48:13 19 reaching the conclusions in your  
02:48:15 20 expert report as well.

02:48:16 21 Correct?

02:48:17 22 A. No.

02:48:17 23 Q. You talk about --- you talk  
02:48:20 24 about in your expert report as a piece  
02:48:23 25 of material you reviewed. You

02:48:26 1 disagree with him.

02:48:26 2 Correct?

02:48:28 3 A. I think it would be proper to  
02:48:29 4 characterize it as I responded to it  
02:48:31 5 because I didn't feel --- I didn't  
02:48:33 6 feel it was very --- I don't know if  
02:48:37 7 the word probative is the right word,  
02:48:39 8 but I didn't think it was very  
02:48:42 9 contributory. I didn't think it  
02:48:44 10 provided very good reason. I didn't  
02:48:46 11 think it was contributory to the  
02:48:46 12 process. I'm sure he's a nice person  
02:48:50 13 and it was a very heartfelt report,  
02:48:52 14 but I don't think it contributed much,  
02:48:54 15 you know, to the discussion, and so I  
02:48:56 16 felt that it was necessary ---.

02:48:57 17 Q. I'm sorry to cut you off.

02:48:58 18 A. I'm sorry.

02:48:59 19 Q. I'm only cutting you off, but  
02:49:02 20 we'll talk about the content of the  
02:49:04 21 report in a moment.

02:49:05 22 A. Okay.

02:49:05 23 Q. I'm simply asking you when you  
02:49:08 24 wrote your report, before you wrote it  
02:49:12 25 you read the Lamb Report. Yes or no?



02:49:15 1 A. In part.

02:49:16 2 Q. So you didn't read the whole

02:49:17 3 Lamb Report. Yes or no?

02:49:17 4 A. I did read the whole Lamb

02:49:19 5 Report.

02:49:19 6 Q. So I'll make it very easy. You

02:49:24 7 either read the report or you didn't.

02:49:27 8 You agree with that.

02:49:28 9 Correct?

02:49:29 10 A. Yes.

02:49:29 11 Q. And you agree that you read the

02:49:30 12 report. You agree with that.

02:49:32 13 Correct?

02:49:32 14 A. Yes.

02:49:32 15 Q. And you agree you did that

02:49:37 16 before you wrote your own report? You

02:49:37 17 agree with that.

02:49:39 18 Correct?

02:49:39 19 A. In part.

02:49:40 20 Q. And you agree that you included

02:49:43 21 in your report reference to the Lamb

02:49:46 22 Report?

02:49:46 23 A. Yes.

02:49:46 24 Q. Okay.

02:49:47 25 So you agree that in making

02:49:48 1 your report you relied on the Lamb  
02:49:53 2 Report? Whether you disagree with its  
02:49:54 3 findings or not is a different  
02:49:56 4 question I will ask you about, but you  
02:49:57 5 do agree you relied on it as something  
02:50:00 6 you reviewed in writing your report.

02:50:01 7 Correct?

02:50:03 8 A. No, because I don't agree with  
02:50:06 9 the word relied.

02:50:07 10 Q. Okay.

02:50:09 11 So moving on to the substance  
02:50:10 12 of the Lamb Report, in the Lamb Report  
02:50:14 13 he talks about the uniqueness and some  
02:50:17 14 of the communities of interest in  
02:50:20 15 Pittsburgh. You agree with that.

02:50:21 16 Correct?

02:50:22 17 A. I would like to see it, but I  
02:50:25 18 mean, yes.

02:50:29 19 ATTORNEY HAVERSTICK:

02:50:29 20 Can he see it?

02:50:31 21 THE WITNESS:

02:50:31 22 I mean ---.

02:50:31 23 JUDGE McCULLOUGH:

02:50:32 24 Excuse me, Mr.

02:50:32 25 Haverstick.

02:50:34 1 ATTORNEY HAVERSTICK:

02:50:36 2 He asked if he

02:50:37 3 would ---.

02:50:38 4 ATTORNEY ATTISANO:

02:50:38 5 I wasn't asking a

02:50:39 6 question specifically but just

02:50:40 7 generally. If he didn't recall --- if

02:50:42 8 I ask him something specifically about

02:50:44 9 the report, Your Honor, I will show it

02:50:46 10 to him. But other than giving him a

02:50:48 11 break to read it, him seeing it, I

02:50:51 12 don't understand how that's going to

02:50:53 13 assist in the answer if he doesn't

02:50:55 14 remember something he can say that and

02:50:56 15 I'll refresh his recollection.

02:50:56 16 JUDGE MCCULLOUGH:

02:50:56 17 Mr. Haverstick.

02:50:58 18 ATTORNEY HAVERSTICK:

02:50:59 19 Fair enough. But he's s

02:51:00 20 asking questions about things I would

02:51:02 21 like to see it. So I think it's only

02:51:03 22 fair that you let him see it if you

02:51:05 23 are going to ask about any substance

02:51:08 24 of it beyond just did you read it or

02:51:10 25 not.

02:51:10 1 ATTORNEY ATTISANO:

02:51:10 2 That's fine.

02:51:10 3 JUDGE MCCULLOUGH:

02:51:10 4 Counsel, you did ask him

02:51:12 5 whether it said uniqueness or

02:51:14 6 descriptions of uniqueness, something

02:51:19 7 along those lines and did he agree.

02:51:20 8 And he said he would like to see it.

02:51:22 9 So do you have a copy of it or are you

02:51:24 10 not going to ---?

02:51:24 11 ATTORNEY ATTISANO;

02:51:24 12 I do, Your Honor. Give

02:51:25 13 me a brief moment and I will get a

02:51:27 14 copy and bring it over.

02:51:28 15 JUDGE MCCULLOUGH:

02:51:28 16 I mean, if you intend to

02:51:28 17 continue along the lines of

02:51:30 18 questioning and he asks to see it, but

02:51:30 19 if you only have general questions

02:51:32 20 ---.

02:51:32 21 ATTORNEY ATTISANO:

02:51:33 22 I only have general ---

02:51:34 23 I'm not going to be ---.

02:51:34 24 JUDGE MCCULLOUGH:

02:51:35 25 Why don't you try to

02:51:36 1 move on and we will see how that goes.

02:51:38 2 ATTORNEY ATTISANO:

02:51:39 3 Okay.

02:51:39 4 BY ATTORNEY ATTISANO:

02:51:40 5 Q. If you don't remember  
02:51:41 6 something, you know that you can just  
02:51:42 7 simply tell us you don't remember?

02:51:44 8 You know you can do that.

02:51:46 9 Right?

02:51:46 10 A. Yes.

02:51:46 11 Q. Okay.

02:51:50 12 So in the --- in the Lamb  
02:51:50 13 Report he explains that certain  
02:51:53 14 neighborhoods in Pittsburgh he  
02:51:55 15 believes represent certain communities  
02:51:59 16 of interest and certain other  
02:52:01 17 neighborhoods represent different  
02:52:05 18 communities of interest. You agree  
02:52:06 19 with that.

02:52:06 20 Right?

02:52:07 21 A. Yes.

02:52:07 22 Q. And you're also aware that  
02:52:08 23 Allegheny County has to be split.

02:52:12 24 Correct?

02:52:13 25 A. Yes.

02:52:13

1

Q. Okay.

02:52:15

2

And that's because the

02:52:16

3

constitutional standard related to

02:52:20

4

population equality.

02:52:23

5

Correct?

02:52:24

6

A. Yes.

02:52:25

7

Q. And you don't use the

02:52:26

8

constitutional constraints when you do

02:52:29

9

your analysis, though.

02:52:30

10

Correct?

02:52:30

11

A. What constitutional

02:52:31

12

constraints?

02:52:32

13

Q. Let me ask you this. When you

02:52:33

14

reached your conclusions, did you use

02:52:35

15

any constitutional constraints in

02:52:37

16

reaching them?

02:52:40

17

A. Well, I knew that Allegheny

02:52:43

18

County would have to be split because

02:52:46

19

it exceeds the --- you know, the

02:52:48

20

population of a single congressional

02:52:50

21

district as required by law.

02:52:51

22

Q. And in the 2018 congressional

02:52:56

23

map, if I represent to you that

02:52:58

24

Allegheny had two --- two split

02:53:02

25

municipalities, South Fayette and Penn

02:53:02 1 Hills, you have no reason to doubt  
02:53:02 2 that.

02:53:06 3 Correct?

02:53:06 4 A. I have no reason to disagree  
02:53:08 5 with you.

02:53:08 6 Q. Okay.

02:53:08 7 And if I represent to you that  
02:53:09 8 the maps put forward by the Senate  
02:53:11 9 Democratic Caucus only split two  
02:53:13 10 municipalities in Allegheny County,  
02:53:17 11 you have no reason to disagree with  
02:53:18 12 that either.

02:53:19 13 Correct?

02:53:22 14 A. Yes.

02:53:22 15 Q. And there's --- and with  
02:53:28 16 respect to the --- the splits of  
02:53:30 17 Pittsburgh put forward by the Senate  
02:53:33 18 Democratic maps, it travels along the  
02:53:36 19 natural border of the Monongahela  
02:53:36 20 River. And you agree that the  
02:53:40 21 Monongahela River is a natural divide  
02:53:42 22 in the City of Pittsburgh.

02:53:43 23 Correct?

02:53:46 24 A. Is it also along the Ohio as  
02:53:47 25 well? I'm trying to recall. Is it

02:53:51 1 possible for you to put the map up?

02:53:53 2 Q. I actually don't have that  
02:53:54 3 section of the map blown up.

02:53:55 4 A. Okay.

02:53:56 5 Q. So I can't put that up right  
02:53:58 6 now. But as a general factor, you  
02:54:00 7 would agree that the rivers in  
02:54:00 8 Pittsburgh do create natural  
02:54:03 9 geographic divides? You agree with  
02:54:05 10 that.

02:54:05 11 Right?

02:54:06 12 A. Natural geographic divide?

02:54:08 13 Q. Yes.

02:54:09 14 A. Yes.

02:54:09 15 Q. Okay.

02:54:12 16 And the decision of which  
02:54:16 17 neighborhoods to put with which is a  
02:54:20 18 subjective decision. You agree with  
02:54:22 19 that.

02:54:22 20 Correct?

02:54:24 21 A. I believe that there are both  
02:54:27 22 subjective and you could also have  
02:54:30 23 objective factors to enter into it.  
02:54:33 24 But it doesn't have to be purely  
02:54:36 25 subjective, so I don't want to



02:54:37 1 represent it as only a judgment.

02:54:40 2 Q. And with respect to splitting

02:54:43 3 the City of Pittsburgh, I mean in your

02:54:46 4 report you stated with respect to

02:54:48 5 splitting the cities, and I'm on

02:54:50 6 page five, near the bottom, there's a

02:54:52 7 flip side for splitting municipalities

02:54:54 8 and counties and it is the opportunity

02:54:54 9 for expanded influence by having two

02:54:54 10 members of Congress. You remember

02:54:54 11 writing that in your report?

02:55:02 12 A. Yes.

02:55:02 13 Q. So you do agree that by

02:55:05 14 splitting Pittsburgh there is a

02:55:06 15 potential flip side of Pittsburgh

02:55:08 16 having two Representatives in Congress

02:55:12 17 and that could be beneficial to the

02:55:13 18 entire City of Pittsburgh? You do

02:55:17 19 agree that's possible.

02:55:17 20 Correct.

02:55:18 21 A. It is possible, yes.

02:55:22 22 Q. And additionally, you're aware

02:55:24 23 that right now Allegheny County is

02:55:26 24 represented by two Democrats,

02:55:31 25 Congressman Conor Lamb and Congressman

02:55:35 1 Michael Doyle? You're aware of that  
02:55:35 2 as well.

02:55:36 3 Right?

02:55:36 4 A. Yes, I'm aware that they're  
02:55:38 5 both in Congress. And they represent  
02:55:41 6 the entirety of Allegheny County?

02:55:44 7 Q. Yes, together.

02:55:44 8 A. Yes.

02:55:47 9 Q. Okay?

02:55:47 10 And so additionally, did you do  
02:55:49 11 any analysis of the Pittsburgh mayoral  
02:55:54 12 race when determining your conclusions  
02:55:57 13 with respect to splitting the City of  
02:55:59 14 Pittsburgh?

02:56:06 15 A. You mean the primary or the  
02:56:08 16 general?

02:56:08 17 Q. I mean the general in which  
02:56:08 18 Pittsburgh elected in its history for  
02:56:08 19 the first time an African-American  
02:56:08 20 Mayor, Ed Gainey?

02:56:12 21 A. No, I did not look at that  
02:56:13 22 race.

02:56:13 23 Q. You're aware that he ran  
02:56:15 24 against a Republican candidate, Tony  
02:56:18 25 Moreno? Do you have any awareness of

02:56:20 1 that?

02:56:20 2 A. I don't think hardly anyone in  
02:56:26 3 the City of Pittsburgh had any  
02:56:26 4 awareness of Mr. Moreno. So no, I did  
02:56:26 5 not.

02:56:26 6 Q. You ought to talk to some  
02:56:29 7 people on Beachview and Brookeline and  
02:56:29 8 the West End,

02:56:31 9 A. Oh, he was the police officer.  
02:56:33 10 Right.

02:56:33 11 Q. Tony Moreno outperformed ---  
02:56:36 12 the Republican candidate outperformed  
02:56:38 13 Ed Gainey in certain neighborhoods  
02:56:39 14 throughout the City of Pittsburgh. Do  
02:56:42 15 you have any familiarity with that?

02:56:43 16 A. That can happen. That's not  
02:56:45 17 surprising.

02:56:45 18 Q. So in vote history --- history,  
02:56:47 19 people can change their minds. It  
02:56:49 20 just involves effort and a bit of  
02:56:51 21 compromise. You agree with that  
02:56:53 22 statement.

02:56:53 23 Right?

02:56:54 24 A. At times, yes.

02:56:54 25 Q. Your statement from the

02:56:56 1 Merry-Go-Round article that was up on  
02:57:01 2 the screen earlier, so in the past  
02:57:01 3 time you agreed with it. Do you agree  
02:57:01 4 with it today?

02:57:04 5 A. I agree that campaigns matter,  
02:57:06 6 absolutely.

02:57:06 7 Q. So to simply say that because  
02:57:10 8 historically residents in the City of  
02:57:12 9 Pittsburgh have voted for Democratic  
02:57:15 10 candidates in the races you only  
02:57:17 11 looked at it's simply incomplete and  
02:57:20 12 lacking to try and conclude that  
02:57:21 13 somehow if the City of Pittsburgh is  
02:57:25 14 split a Republican candidate or  
02:57:27 15 Democratic candidate might have less  
02:57:31 16 of an interest in intending to further  
02:57:34 17 those votes or providing constituent  
02:57:41 18 services?

02:57:41 19 A. It's a matter of likelihood.  
02:57:43 20 That's how you would apply it.

02:57:44 21 Q. And you agree that when you  
02:57:44 22 determined your likelihood you didn't  
02:57:45 23 look at the most recent trends in  
02:57:47 24 voting history for the City of  
02:57:50 25 Pittsburgh in a race that was

02:57:52 1 competitive between a Democrat and  
02:57:52 2 Republican? You didn't do that, did  
02:57:52 3 you?

02:57:55 4 A. Once race is not a trend. You  
02:57:55 5 said trend. That's not true. One  
02:57:56 6 race is not a trend.

02:57:57 7 Q. But did you consider that race  
02:57:59 8 in determining your trend?

02:58:00 9 A. I did not consider the Mayor's  
02:58:02 10 race.

11 Q. Thank you.

12 JUDGE MCCULLOUGH:

13 Okay.

14 Counsel --- is Counsel  
15 --- is someone's making a question?  
16 Excuse me. I thought I heard a  
17 question from counsel.

18 ATTORNEY ATTISANO:

02:58:23 19 Your Honor, I was not,  
02:58:24 20 but at this time I would like to move  
02:58:26 21 into admission the Lamb Report, which  
02:58:27 22 has been provided to all counsel  
02:58:30 23 because it was an exhibit in our brief  
02:58:32 24 and an expert relied on it in drafting  
02:58:35 25 their expert report. And under the

02:58:37 1 rules of expert reports, something  
02:58:39 2 that is otherwise admissible in which  
02:58:42 3 an expert relied on to form their  
02:58:45 4 report can be admissible to the Court.

02:58:55 5 ATTORNEY HAVERSTICK:  
02:58:55 6 Objection, Your Honor.

02:58:57 7 JUDGE MCCULLOUGH:  
02:58:57 8 Do you want to wait  
02:58:57 9 until you produce your --- do your  
02:58:57 10 expert? Go ahead, Mr. Haverstick.

02:58:55 11 ATTORNEY HAVERSTICK:  
02:59:04 12 I'm not sure I care, one  
02:59:04 13 way or the other. No, I don't have  
02:59:04 14 any objection.

02:59:04 15 THE WITNESS:  
02:59:06 16 I --- I hate --- can I  
02:59:06 17 get a quick trip to the restroom since  
02:59:08 18 I went through two of these? I  
02:59:13 19 apologize for that.

02:59:13 20 JUDGE MCCULLOUGH:  
02:59:13 21 Hold on.

02:59:13 22 THE WITNESS:  
02:59:14 23 Okay.

02:59:16 24 JUDGE MCCULLOUGH:  
02:59:17 25 Mr. Attisano, you're

02:59:19 1 moving in --- but you are going to  
02:59:19 2 have your expert after we break?

02:59:23 3 ATTORNEY ATTISANO:

02:59:23 4 We will be presenting an  
02:59:25 5 expert, but at this time --- at this  
02:59:26 6 time I'm asking ---.

02:59:26 7 JUDGE MCCULLOUGH:

02:59:26 8 Do you want to wait  
02:59:27 9 until you do your expert testimony to  
02:59:31 10 move for admission of the document  
02:59:38 11 then.

02:59:39 12 ATTORNEY ATTISANO:

02:59:39 13 Our expert doesn't  
02:59:42 14 incorporate the Lamb Report. I'd like  
02:59:42 15 to do it now, Your Honor. I believe I  
02:59:42 16 have a basis for it and I would like  
02:59:43 17 to do it now.

02:59:43 18 ATTORNEY HAVERSTICK:

02:59:44 19 Now wait a minute, Your  
02:59:44 20 Honor. I mean, I don't have a problem  
02:59:46 21 with the report coming in, but isn't  
02:59:47 22 counsel one of the gentlemen who stood  
02:59:50 23 up and said, oh, no, no, if it's not  
02:59:51 24 talked about in the report, you can't  
02:59:52 25 talk about as an expert? Am I wrong

02:59:55 1 about that or did you not argue that  
02:59:57 2 Mr. Naughton was not allowed to look  
03:00:02 3 at maps that weren't in his report?

03:00:03 4 ATTORNEY ATTISANO:

03:00:04 5 Your Honor, I'm simply  
03:00:04 6 asking for the admission of the Lamb  
03:00:05 7 Report because Mr. Naughton relied on  
03:00:08 8 in his report. That's all I'm moving  
03:00:09 9 for at this time, Your Honor.

03:00:09 10 ATTORNEY HAVERSTICK:

03:00:09 11 And I don't have any  
03:00:10 12 objection to that bit of it, Your  
03:00:12 13 Honor.

03:00:12 14 ATTORNEY ATTISANO:

03:00:13 15 Okay.

03:00:13 16 ATTORNEY HAVERSTICK:

03:00:14 17 I may, depending on what  
03:00:15 18 we're doing with it, but ---.

03:00:16 19 JUDGE MCCULLOUGH:

03:00:17 20 Does anyone have an  
03:00:18 21 objection to moving the Lamb Report  
03:00:21 22 into evidence?

03:00:25 23 ATTORNEY LEWIS:

03:00:27 24 Your Honor, Patrick  
03:00:27 25 Lewis for the Republican House



03:00:31 1 Intervenor. We do object to this on  
03:00:32 2 the basis that it appears to be an  
03:00:36 3 expert report. He's offering an  
03:00:36 4 assessment --- Mr. Lamb is offering an  
03:00:37 5 assessment out of the House Democratic  
03:00:39 6 plan.

03:00:47 7 ATTORNEY ATTISANO:

03:00:47 8 No.

03:00:48 9 ATTORNEY LEWIS:

03:00:50 10 We've been confusing all  
03:00:51 11 day, but this is offering an analysis  
03:00:54 12 outside of the personal knowledge of  
03:00:56 13 this witness, and he's commenting  
03:00:57 14 specifically on the proposed map.  
03:00:59 15 It's an expert report. They have an  
03:01:01 16 expert. It's not Mr. Lamb.

03:01:03 17 JUDGE MCCULLOUGH:

03:01:03 18 Let's --- let's defer  
03:01:05 19 decision on this. We're going to  
03:01:07 20 finish with the examination of this  
03:01:09 21 witness first.

03:01:11 22 ATTORNEY HAVERSTICK:

03:01:11 23 Your Honor, I have no  
03:01:12 24 further questions for the witness. I  
03:01:14 25 only rose to the podium because I

03:01:17 1 think I have to do it now, move to put  
03:01:19 2 into evidence the report of Dr.  
03:01:22 3 Burnell. I expect that's something  
03:01:24 4 we're going to talk about in Chambers,  
03:01:26 5 but as a procedural matter, I think  
03:01:28 6 now is when I'm supposed to move to  
03:01:33 7 put it in.

03:01:34 8 But no, I have no  
03:01:35 9 further questions for the witness.

03:01:37 10 JUDGE MCCULLOUGH:

03:01:37 11 Okay.

03:01:38 12 Dr. Naughton, you may  
03:01:39 13 step down.

03:01:39 14 THE WITNESS:

03:01:40 15 Thank you.

03:01:41 16 JUDGE MCCULLOUGH:

03:01:42 17 Unless Counsel has any  
03:01:44 18 Recross.

03:01:44 19 Okay.

03:01:44 20 So before we take a  
03:01:45 21 break, does anyone have an objection  
03:01:46 22 to moving into evidence the report of  
03:01:52 23 Dr. Burnell?

03:01:52 24 ATTORNEY WIYGUL:

03:01:55 25 The Governor objects,

03:01:55 1 Your Honor.

03:01:55 2 JUDGE MCCULLOUGH:

03:01:55 3 And basis for your  
03:01:55 4 objection?

03:01:57 5 ATTORNEY WIYGUL:

03:02:00 6 Dr. Burnell is not  
03:02:00 7 called as a witness --- well, there's  
03:02:02 8 several. He was not called as a  
03:02:04 9 testifying as a witness in this matter  
03:02:05 10 and in addition, that would have the  
03:02:08 11 effect of allowing two expert reports  
03:02:11 12 in evidence for this party which I  
03:02:15 13 think is --- would be a privilege  
03:02:18 14 enjoyed by no other party.

03:02:21 15 ATTORNEY HAVERSTICK:

03:02:21 16 With respect, Your  
03:02:22 17 Honor, it's what your order allows.  
03:02:24 18 And I have a bench memorandum I'm  
03:02:26 19 prepared to hand up and provide to  
03:02:30 20 Counsel as well. And I will do so.  
03:02:32 21 Your order specifically contemplates  
03:02:34 22 it, because it allows for one or more  
03:02:37 23 experts or one or two experts to put  
03:02:39 24 in reports. They don't have to be  
03:02:43 25 the same person, but only one may

03:02:43 1 testify.

03:02:44 2 They could have done the  
03:02:45 3 same thing, they just chose not to.  
03:02:47 4 And you know, I thought yesterday we  
03:02:49 5 were making some headway when we  
03:02:51 6 agreed to admit declarations without  
03:02:54 7 much of a problem. And I don't  
03:02:57 8 understand why it's acceptable for  
03:03:00 9 Counsel for the Governor, sometimes,  
03:03:02 10 for out-of-court statements to come in  
03:03:08 11 and not other times.

03:03:09 12 And as the Court rightly  
03:03:09 13 noted yesterday Amici are putting in  
03:03:12 14 expert reports that it Court is going  
03:03:13 15 to review and give whatever weight the  
03:03:18 16 Court believes they are due. It's no  
03:03:20 17 different. It's no different.

03:03:21 18 JUDGE MCCULLOUGH:

03:03:21 19 I want to get the  
03:03:22 20 objections on the record for Counsel  
03:03:24 21 sake.

03:03:26 22 ATTORNEY JOHNSON:

03:03:26 23 Your Honor, for the  
03:03:27 24 Gressman Math Scientist Petitioners  
03:03:27 25 join in the objection. The Burnell

03:03:32 1 report is inadmissible hearsay. We  
03:03:34 2 have two cites for that point if you  
03:03:37 3 want, we can supply them during the  
03:03:40 4 status conference if that makes sense  
03:03:40 5 to do so. Thank you.

03:03:41 6 JUDGE MCCULLOUGH:

03:03:41 7 And Mr. Gordon?

03:03:42 8 ATTORNEY GORDON:

03:03:42 9 Yes, Your honor. The  
03:03:43 10 Carter Petitioners join in the  
03:03:43 11 objection lodged by Governor and the  
03:03:46 12 Gressman Petitioners on the similar  
03:03:49 13 matter.

03:03:51 14 JUDGE MCCULLOUGH:

03:03:51 15 And I see somebody is  
03:03:53 16 stepping up on the other side.

03:03:55 17 ATTORNEY SENOFF:

03:03:55 18 Your Honor, just as a  
03:03:57 19 point of clarification --- and perhaps  
03:03:59 20 Mr. Haverstick can clear this up.  
03:04:02 21 This is not --- Mr. Haverstick is not  
03:04:04 22 intending to call this expert as a  
03:04:05 23 live witness; am I correct?

03:04:10 24 ATTORNEY HAVERSTICK:

03:04:10 25 No.

03:04:15 1 ATTORNEY SENOFF:

03:04:17 2 Thank you. Then we have

03:04:17 3 no objection, Your Honor.

03:04:18 4 JUDGE MCCULLOUGH:

03:04:22 5 Thank you Mr. Senoff and

03:04:22 6 Mr. Attisano?

03:04:27 7 ATTORNEY ATTISANO:

03:04:28 8 Join in the objection.

03:04:28 9 JUDGE MCCULLOUGH:

10 Okay.

11 So we have it all on the

12 record. We're going to take a break.

13 The Court will defer making a

14 judgement on it after our status

03:04:29 15 conference. So I'm asking Counsel now

03:04:29 16 to --- the lead counsel to meet again

03:04:31 17 first in the same conference room

03:04:32 18 where we met yesterday morning, and

03:04:35 19 then we will meet for 15 minutes.

03:04:38 20 Let's reconvene then --- what time is

03:04:40 21 it here? It's 12:18. I think we can

03:04:43 22 reconvene at 12:50 that will still

03:04:48 23 give you time for a comfort break for

03:04:50 24 all of you. So 12:50 back here in

03:04:52 25 Court. Thank you.

03:04:53

1

ATTORNEY HAVERSTICK:

03:04:54

2

Thank you, Your Honor.

03:04:56

3

COURT CRIER TURNER:

03:04:57

4

Commonwealth Court is

03:04:58

5

now in recess.

03:04:58

6

---

03:04:58

7

(WHEREUPON, A BREAK WAS TAKEN.)

04:23:46

8

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04:23:46

9

COURT CRIER HOLLAND:

04:23:46

10

All rise. Commonwealth

04:23:47

11

Court is back in session. Please be

04:23:49

12

seated.

04:23:50

13

JUDGE MCCULLOUGH:

04:23:50

14

Good afternoon. It is

04:23:51

15

afternoon now. And we did address

04:23:59

16

some matters in a status conference,

04:24:01

17

so thank you to Counsel for that.

04:24:04

18

We will begin now with

04:24:07

19

the testimony by the last expert

04:24:10

20

witness for the Senate Democratic

04:24:17

21

Intervenors, Mr. Attisano. I should

04:24:38

22

note this witness is as a virtual ---

04:24:38

23

is giving virtual testimony so we all

04:24:40

24

have to look at the screen and not the

04:24:43

25

witness box this time.

04:24:45 1 COURT CRIER HOLLAND:

04:24:45 2 Before we begin, Mr.

04:24:47 3 Caughey, can you please raise your

04:24:54 4 right hand?

04:24:54 5 ---

04:24:54 6 DEVIN CAUGHEY,

04:24:54 7 CALLED AS A WITNESS IN THE FOLLOWING

04:24:54 8 PROCEEDINGS, HAVING FIRST BEEN DULY

04:24:54 9 SWORN, TESTIFIED AND SAID AS FOLLOWS:

04:24:56 10 ---

04:24:56 11 COURT CRIER HOLLAND:

04:24:56 12 Thank you.

04:24:56 13 ---

04:24:56 14 DIRECT EXAMINATION

04:24:57 15 ---

04:24:57 16 BY ATTORNEY ATTISANO:

04:24:58 17 Q. Good afternoon, Dr. Caughey,

04:25:01 18 can you hear me okay?

04:25:03 19 JUDGE MCCULLOUGH:

04:25:03 20 We can't hear you. We

04:25:06 21 are having trouble with his ---.

04:25:09 22 COURT CRIER HOLLAND:

04:25:09 23 Can you turn the volume

04:25:12 24 up on your laptop?

04:25:12 25 THE WITNESS:



04:25:19 1 Can you hear me now?

04:25:19 2 ATTORNEY ATTISANO:

04:25:19 3 We can hear you now.

04:25:20 4 Thank you.

04:25:21 5 BY ATTORNEY ATTISANO:

04:25:22 6 Q. So Dr. Caughey, so you  
04:25:26 7 understand, there seems to be a slight  
04:25:27 8 half a second to one second delay in  
04:25:29 9 between responses. So please just try  
04:25:31 10 to be thoughtful of that for the  
04:25:33 11 communication.

04:25:33 12 Can you do that for us?

04:25:39 13 A. Uh-huh (yes).

04:25:39 14 Q. Thank you. Okay. Can you  
04:25:41 15 please introduce yourself to the  
04:25:45 16 Court. Tell us what your current  
04:25:46 17 position is and just describe,  
04:25:48 18 generally, your work in the  
04:25:50 19 redistricting field?

04:25:54 20 A. Well, first of all, my name is  
04:26:02 21 Devin Caughey. I know it's hard to  
04:26:02 22 pronounce, but I appreciate you  
04:26:02 23 working on that.

04:26:02 24 And I just want to start out by  
04:26:02 25 thanking you for the Court allowing me

04:26:08 1 to testify remotely. I'm actually  
04:26:11 2 dealing a health crisis in my family  
04:26:12 3 right now, so I couldn't leave. But I  
04:26:14 4 appreciate being able to do this over  
04:26:15 5 the computer.

04:26:17 6 So currently I'm an associate  
04:26:22 7 professor with tenure at the  
04:26:23 8 Massachusetts Institute of Technology  
04:26:23 9 in the Department of Political  
04:26:25 10 Science. I received a Ph.D. in  
04:26:29 11 political science from the University  
04:26:32 12 of California Berkley. I also hold a  
04:26:34 13 history degree from Yale at Cambridge.

04:26:37 14 So my academic focus is mainly  
04:26:42 15 on American politics and statistical  
04:26:44 16 methods and the interaction between  
04:26:45 17 those two. And I focus particularly  
04:26:49 18 on public opinion, election,  
04:26:52 19 representation. And I published many  
04:26:58 20 academic articles, but among those  
04:27:01 21 public research on gerrymandering in  
04:27:03 22 places like the election law reviews  
04:27:06 23 --- I'm sorry, Election Law Journal  
04:27:08 24 and also I just finished a forthcoming  
04:27:10 25 book with the University of Chicago

04:27:12 1 press that focuses, among other  
04:27:14 2 things, on partisan gerrymandering at  
04:27:16 3 the state level and how that fits into  
04:27:16 4 the representational process.

04:27:16 5 So that's my academic  
04:27:25 6 background, and I've also done some  
04:27:29 7 expert witness in the past.

04:27:30 8 Q. Could you generally describe  
04:27:31 9 the expert witness work you've done in  
04:27:31 10 the past?

04:27:39 11 A. On --- I completed one case  
04:27:41 12 that I can sort of talk really about,  
04:27:42 13 but it was very similar to this case  
04:27:45 14 in that I was asked to analyze the  
04:27:48 15 partisan bias of a districting map,  
04:27:52 16 and I did so. I did that in Oregon.

04:27:56 17 Q. Okay.

04:27:57 18 Thank you?

04:27:57 19 And here you were retained by  
04:28:00 20 the Senate Democratic Caucus to review  
04:28:02 21 certain maps for partisan fairness.

04:28:04 22 Correct? Is that a yes?

04:28:04 23 Dr. Caughey, I'm not able to  
04:28:04 24 hear you there when you respond.

04:28:22 25 A. Let me see if this will work

04:28:23 1 better.

04:28:23 2 Q. That was better when you

04:28:24 3 said ---.

04:28:24 4 JUDGE MCCULLOUGH:

04:28:24 5 I think when he leans

04:28:27 6 forward.

04:28:28 7 BY ATTORNEY ATTISANO:

04:28:29 8 Q. I think when you lean forward

04:28:31 9 it may be better. Please keep that in

04:28:32 10 mind. Thank you.

04:28:38 11 And so Dr. Caughey, which maps

04:28:41 12 did you review for your analysis?

04:28:43 13 A. As a baseline, I started with a

04:28:50 14 current map that was in place since

04:28:52 15 2018. I also reviewed Governor Wolf's

04:28:55 16 proposal. I reviewed two proposals by

04:29:00 17 Senate Democrats, which I refer to in

04:29:02 18 my report as Democratic map number 1

04:29:04 19 and number 2.

04:29:05 20 A proposal by the Pennsylvania

04:29:07 21 House Republican Caucus and a map ---

04:29:12 22 I did a very --- as an appendix I

04:29:12 23 added a brief analysis of

04:29:20 24 Representative Reschenthaler, which I

04:29:20 25 think I referred to in my Senator

04:29:20 1 Reschenthaler and I apologize for  
04:29:30 2 that.

04:29:30 3 Q. He probably won't mind the  
04:29:31 4 promotion. And just to be clear, you  
04:29:33 5 have an analysis of one Reschenthaler  
04:29:36 6 map in your report.

04:29:37 7 Correct? Okay. Sorry, could  
04:29:41 8 you repeat your answer?

04:29:45 9 Okay.

04:29:46 10 I apologize again, Dr. Caughey,  
04:29:51 11 I could not hear you that time. It's  
04:29:51 12 correct that you have the analysis of  
04:29:53 13 one map for the Congressman  
04:29:55 14 Reschenthaler.

04:29:56 15 Correct? I apologize and your  
04:30:03 16 answer was not audible.

04:30:05 17 A. All right. That is correct.

04:30:06 18 Q. That is much better. Thank  
04:30:09 19 you. Thank you very much.

04:30:09 20 And that was map 2, the  
04:30:13 21 Reschenthaler map 2.

04:30:14 22 Correct?

04:30:15 23 A. I believe so. That's how it  
04:30:17 24 was labeled the files that I received.

04:30:21 25 Q. Thank you.

04:30:22 1 And just why do you only have  
04:30:23 2 analysis of Reschenthaler map 2 rather  
04:30:25 3 than also Reschenthaler map 1?

04:30:30 4 A. Well, I suppose --- I don't  
04:30:32 5 know the ultimate --- it's probably a  
04:30:41 6 combination of matter of a limited  
04:30:42 7 time, but that was the only map that I  
04:30:44 8 received. So it was not the I  
04:30:44 9 declined to --- I reviewed all the  
04:30:45 10 maps that I received.

04:30:48 11 Q. Okay.

04:30:50 12 And could you please describe  
04:30:51 13 your process in comparing the maps in  
04:30:55 14 doing your analysis?

04:30:57 15 A. Sure. So I followed what I  
04:30:58 16 considered to be a very standard  
04:31:00 17 process in political science, my  
04:31:03 18 discipline, where I was asked to  
04:31:07 19 evaluate the partisan fairness of  
04:31:09 20 these maps, of all the maps. And I  
04:31:12 21 did so in a perfectly parallel way. I  
04:31:14 22 applied the same methods to every one.

04:31:18 23 And so the first thing I would  
04:31:18 24 like to say, though, is that partisan  
04:31:21 25 fairness is a somewhat abstract

04:31:27 1 concept, right. And so I think it's  
04:31:29 2 important to talk about it in the  
04:31:30 3 abstract before thinking about  
04:31:32 4 specific measures of partisan  
04:31:34 5 fairness. So in the abstract of a map  
04:31:39 6 --- political scientists consider a  
04:31:40 7 map fair if it treats parties equally  
04:31:44 8 or symmetrically or neutrally in the  
04:31:49 9 sense that the outcome of elections  
04:31:51 10 shouldn't depend on which party you  
04:32:00 11 substitute in --- which party got the  
04:32:01 12 X number of votes, right. So it  
04:32:03 13 should depend on the party in question  
04:32:03 14 what the outcome is.

04:32:06 15 So there are different ways of  
04:32:11 16 operationalizing that or measuring  
04:32:12 17 that in practice, right, and each of  
04:32:13 18 those different measures captures a  
04:32:15 19 different aspect or a different way of  
04:32:17 20 getting at that basic idea of partisan  
04:32:19 21 fairness.

04:32:25 22 And so since there are  
04:32:26 23 different measures, I took --- there  
04:32:27 24 are four very common measures that are  
04:32:29 25 used, partisan symmetry, the

04:32:31 1 efficiency gap, mean-median difference  
04:32:35 2 and the declination, was just four  
04:32:38 3 standard measures. And they're all  
04:32:40 4 trying to get at the same idea of  
04:32:44 5 fairness, partisan fairness.

04:32:46 6 Q. And Dr. Caughey, what were  
04:32:54 7 those four measures you said that you  
04:32:54 8 used here?

04:32:54 9 A. The first one is called  
04:32:54 10 partisan symmetry or its reverse is  
04:32:57 11 partisan bias, that's how I will be  
04:32:58 12 referring to it primarily. The  
04:33:00 13 efficiency gap is the second one, the  
04:33:03 14 mean-median difference is the third  
04:33:08 15 one. And the declination is the  
04:33:11 16 fourth one.

04:33:12 17 Q. Okay.

04:33:12 18 Could you just briefly describe  
04:33:13 19 what each one of those are?

04:33:17 20 A. Sure. I'll start with partisan  
04:33:19 21 symmetry because in some ways it's the  
04:33:21 22 most fundamental or the most general.  
04:33:23 23 So partisan symmetry is based on the  
04:33:26 24 concept of what's called the seats  
04:33:28 25 votes curve, the seats votes function,



04:33:31 1 which is basically just the  
04:33:36 2 relationship between a party's vote  
04:33:39 3 share and their expected seat share,  
04:33:41 4 okay. And generally speaking,  
04:33:43 5 obviously, we expect that function to  
04:33:45 6 be increasing, right, to go up. As  
04:33:49 7 vote share goes up, a party's vote  
04:33:51 8 share goes up, we would expect its  
04:33:53 9 seat share to increase as well. But  
04:33:54 10 it can increase at --- you know, the  
04:33:57 11 exact shape of that function can look  
04:34:00 12 very different, right. And there's  
04:34:02 13 two basic characteristics of that  
04:34:06 14 curve.

04:34:06 15 One is you might call it a  
04:34:08 16 slope or sometimes that's called the  
04:34:10 17 responsiveness. And that's just how  
04:34:12 18 steeply seat share increases as a  
04:34:12 19 function of vote share. Okay. So in  
04:34:20 20 a proportional system, for example, a  
04:34:21 21 system of proportional representation,  
04:34:26 22 that slope is about a one-to-one  
04:34:28 23 slope. All right. So you increase  
04:34:30 24 your vote share by one percent, your  
04:34:32 25 seat chair increases by one percent

04:34:38 1 for a given party. But that's not  
04:34:40 2 typically what you observe in a  
04:34:41 3 majoritarian system such as  
04:34:41 4 Pennsylvania or other U.S. states,  
04:34:44 5 which is where the slope can vary, but  
04:34:46 6 it's usually, you know, somewhere like  
04:34:48 7 two to one. And that's due to a  
04:34:48 8 phenomenon sometimes known as a  
04:34:55 9 winner's bonus, when we just naturally  
04:34:57 10 expect the party that earns the  
04:34:59 11 majority of votes to earn a super  
04:35:01 12 majority of seats, okay. So that's  
04:35:05 13 one part of the seats vote curve is  
04:35:08 14 how steeply the curve rises.

04:35:10 15 But another key characteristic  
04:35:12 16 is the bias of the curve, which is  
04:35:14 17 sort of like --- you can think of that  
04:35:16 18 as how at every point is it --- how  
04:35:19 19 high is it if you move it up and down.  
04:35:21 20 You're increasing it or decreasing the  
04:35:23 21 bias in favor of a one party or  
04:35:26 22 another. And a key characteristic of  
04:35:36 23 a symmetrical or fair seats votes  
04:35:38 24 curve is that it should treat both  
04:35:39 25 parties symmetrically or neutrally.

04:35:43 1 So if one party earns 55 percent of  
04:35:47 2 the votes and then gets 60 percent of  
04:35:49 3 the seats and then if other party gets  
04:35:49 4 50 percent of the votes --- or 55  
04:35:49 5 percent of the votes, I'm sorry, they  
04:35:52 6 should also get 60 percent of the  
04:35:54 7 seats. So it's not that the seat  
04:35:55 8 share has to be proportional to vote  
04:36:01 9 share, but it does have to be the same  
04:36:01 10 bonus for each party, right.

04:36:02 11 And usually that's sort of easy  
04:36:05 12 to think about when we just consider  
04:36:07 13 what happens if both parties get  
04:36:10 14 50 percent of the vote, right. If  
04:36:12 15 they both get 50 percent of the vote,  
04:36:14 16 they tie, right. But if they win  
04:36:18 17 50 percent of the vote and one party  
04:36:20 18 gets 55 percent of the seats, that  
04:36:21 19 indicates a bias of five percentage  
04:36:26 20 points in favor of the party that got  
04:36:31 21 more seats, right. So that is what we  
04:36:35 22 call partisan bias. That's one  
04:36:35 23 measure I look at.

04:36:35 24 Another measure which is also  
04:36:38 25 very common is called the efficiency

04:36:39 1 gap.

04:36:39 2 Q. And Dr. Caughey, before you go  
04:36:39 3 into the efficiency gap, just to be  
04:36:47 4 clear, with the party symmetry and the  
04:36:53 5 winner bonus, is there a particular  
04:36:55 6 winner bonus that you believe deviates  
04:37:01 7 from partisan fairness or is it more  
04:37:03 8 about it being symmetrical and the  
04:37:05 9 same for whichever party wins?

04:37:07 10 A. So I think that reasonable  
04:37:09 11 arguments can be made for different  
04:37:11 12 winner's bonuses, so I don't have a  
04:37:14 13 firm position that there is a single  
04:37:16 14 number that the majority party should  
04:37:18 15 get, say 2 to 1, you know, seats to  
04:37:22 16 votes. But it is I think very  
04:37:27 17 difficult to argue with the idea that  
04:37:31 18 whatever the bonus is it should be the  
04:37:37 19 same for both parties, right. So if  
04:37:39 20 one party gets a two to one bonus,  
04:37:39 21 then the other party should get a two  
04:37:45 22 to one bonus. So the answer to your  
04:37:46 23 question is, no, there is no single  
04:37:47 24 number, but it should be the same  
04:37:49 25 between the two parties.

04:37:51 1 Q. Thank you. And I think you  
04:37:52 2 were believing --- I believe you were  
04:37:53 3 starting to discuss the efficiency gap  
04:37:56 4 when I cut you off. Could you please  
04:37:58 5 go ahead and describe the efficiency  
04:38:00 6 gap?

04:38:00 7 A. Sure. So the efficiency gap is  
04:38:00 8 another way of operationalizing this  
04:38:09 9 notion of a partisan fairness, you  
04:38:10 10 know, the notion that a map should  
04:38:11 11 treat the parties equally or mutually.  
04:38:15 12 And instead of focusing directly on  
04:38:18 13 the seats votes curve, it focuses on  
04:38:21 14 this notion of wasted votes, okay.  
04:38:21 15 And according to the efficiency gap is  
04:38:32 16 based on the idea that the number of  
04:38:33 17 wasted votes or the share of wasted  
04:38:33 18 votes for each party should be equal.  
04:38:35 19 And what does that mean? What's a  
04:38:36 20 wasted vote? Well, a wasted vote, as  
04:38:38 21 I'm sure someone has said it in this  
04:38:40 22 trial so far, is a vote cast for a  
04:38:46 23 losing candidate or a vote cast for a  
04:38:49 24 winning candidate beyond the minimum  
04:38:51 25 necessary to ensure that that

04:38:53 1 candidate won, beyond 50 percent plus  
04:38:53 2 one, right.

04:38:54 3 So when one party wastes more  
04:39:07 4 votes than the other party, then their  
04:39:07 5 votes, in sum and substance, count for  
04:39:07 6 less, right. More of their votes  
04:39:07 7 don't make a difference in terms of  
04:39:10 8 who wins seats, right. They're  
04:39:10 9 diluted relative to the other party.

04:39:12 10 And you can see there is a  
04:39:13 11 natural connection there to the sort  
04:39:17 12 of traditional pattern of packing and  
04:39:19 13 cracking in partisan gerrymandering  
04:39:24 14 where a gerrymandering party tends to  
04:39:29 15 want to take all of their --- the  
04:39:30 16 opposing party's votes and pack them  
04:39:32 17 into a few districts, right, where if  
04:39:34 18 they're winning by, say, 90 percent,  
04:39:37 19 they're winning 90 percent of the vote  
04:39:37 20 in those districts, then a full  
04:39:40 21 40 percent of the votes cast in those  
04:39:43 22 districts are going to be wasted,  
04:39:44 23 right, because they're way over what  
04:39:47 24 you would need to win, right.

04:39:48 25 And similarly, that makes the

04:39:49 1 other party's votes very efficient.  
04:39:50 2 But cracking, which is trying to make  
04:39:54 3 sure that gerrymandering parties'  
04:39:55 4 votes are spread evenly, is a very  
04:39:58 5 efficient way of spreading votes,  
04:40:00 6 right. It ensures that --- it means  
04:40:03 7 that if you are winning every district  
04:40:05 8 by 55 or 60 percent, you're only  
04:40:08 9 wasting about 10 to 15 percent of the  
04:40:10 10 votes in each of those districts,  
04:40:12 11 right, so the efficiency gap picks up  
04:40:23 12 on that pattern specifically.

04:40:23 13 Q. And with respect to the  
04:40:25 14 efficiency gap that you just  
04:40:26 15 described, does it matter which  
04:40:28 16 previous election data is selected  
04:40:32 17 when doing the analysis?

04:40:33 18 A. Yes, that's an important point.  
04:40:37 19 So all of these measures depend on  
04:40:41 20 exactly what you think the vote share  
04:40:43 21 is going to be, right. And the vote  
04:40:47 22 share in every district and therefore  
04:40:49 23 what the seat share is a function of  
04:40:52 24 that. So always when academic  
04:40:58 25 political scientists are making these

04:40:58 1 evaluations, they want to not only  
04:40:59 2 have a realistic predictions of what  
04:41:01 3 the vote share --- what they expect  
04:41:02 4 the vote share to be, but also to have  
04:41:03 5 a realistic sense of what the  
04:41:06 6 uncertainty of those predictions are  
04:41:08 7 and to evaluate these metrics across a  
04:41:11 8 range of scenarios that they --- that  
04:41:16 9 are realistic going forward. All  
04:41:16 10 right.

04:41:18 11 So you can --- it's often  
04:41:21 12 possible to sort of cherry pick a  
04:41:27 13 particular vote share that makes your  
04:41:29 14 map look good, right, where you pick a  
04:41:29 15 vote share to make sure that the other  
04:41:36 16 side barely wins a few districts. But  
04:41:37 17 that's not a realistic or common  
04:41:39 18 scenario, and therefore, can give a  
04:41:39 19 misleading sense of the fairness of  
04:41:42 20 the map.

04:41:43 21 Q. And could you go on to the next  
04:41:47 22 factor in your analysis, the  
04:41:49 23 mean-median?

04:41:50 24 A. Sure. And I will talk about  
04:41:52 25 these fairly briefly because they pick



04:41:54 1 up on similar dynamics. So the  
04:41:54 2 mean-median difference, which we've  
04:41:54 3 already heard discussion of, is just  
04:41:54 4 the difference because the average  
04:42:04 5 vote share amongst districts, which if  
04:42:05 6 turn out equal is just a statewide  
04:42:08 7 share that a party earns, and the  
04:42:10 8 difference in the median district,  
04:42:15 9 right.

04:42:15 10 So it might be easiest to think  
04:42:19 11 about it if there's one district that  
04:42:21 12 a party wins by 90 percent or, you,  
04:42:24 13 know 90/10, then loses all the  
04:42:30 14 districts by 49/51, the average vote,  
04:42:35 15 depending on other districts, is going  
04:42:38 16 to be close to 50/50. But from --- it  
04:42:38 17 could be 50/50, but the median  
04:42:43 18 district is going to be higher than  
04:42:44 19 that, right. If the median vote is  
04:42:47 20 that if you lined up all the districts  
04:42:51 21 in a line in order of how increasing  
04:42:55 22 Republican share, the one in the  
04:42:56 23 middle is the median, right. So in  
04:42:59 24 that case, in that concocted scenario  
04:43:01 25 that I just gave you, the median is

04:43:03 1 guaranteed to be 49 percent in that  
04:43:07 2 case for the party that won 90 percent  
04:43:14 3 in the one district.

04:43:15 4 So that's an indication the  
04:43:15 5 mean-median just picks up on the  
04:43:15 6 asymmetry of the distribution of  
04:43:19 7 district partisanship, the skewness  
04:43:20 8 sometimes called, of the distribution  
04:43:23 9 of partisanship.

04:43:26 10 And the next measure I talk  
04:43:28 11 about is the declination, which is a  
04:43:28 12 little bit more technical and recently  
04:43:32 13 developed measure. It was originally  
04:43:33 14 formulated in thinking about how the  
04:43:35 15 angles, if you line up all the  
04:43:37 16 districts and the Democratic districts  
04:43:40 17 are over here and the Republican  
04:43:41 18 districts over here, the angle --- how  
04:43:43 19 the angle changes where partisanship  
04:43:43 20 shifts, where party control shifts,  
04:43:47 21 but I think ---.

04:43:47 22 Q. Dr. Caughey, when you say line  
04:43:52 23 up the districts are you referring to  
04:43:53 24 lining them up on a graph?

04:43:55 25 A. Yes. Thank you for --- and I

04:44:00 1 know maybe my hand gestures are not  
04:44:02 2 admissible as evidence there, so I  
04:44:04 3 will try to avoid that, but I think a  
04:44:13 4 more intuitive way of thinking about  
04:44:13 5 the declination it just you compare  
04:44:15 6 --- more normalized compared to the  
04:44:20 7 lopsidedness of Democratic and  
04:44:23 8 Republican districts, right.  
04:44:23 9 Democratic districts tend to be much  
04:44:23 10 more --- Democratic won districts tend  
04:44:23 11 to be much more lopsided than the  
04:44:31 12 angle of the Democratic side of the  
04:44:33 13 district --- that hypothetical block  
04:44:33 14 that we were just talking about is  
04:44:35 15 going to be steeper.

04:44:37 16 So I think the key thing to  
04:44:38 17 keep in mind here is that all of these  
04:44:41 18 are different ways of getting at the  
04:44:43 19 idea that the distribution of district  
04:44:47 20 partisanship is asymmetrical or treats  
04:44:47 21 the parties differently, right, in  
04:44:56 22 ways that --- in terms of the  
04:44:56 23 translation of their votes into seats.  
04:44:58 24 And all of these measures have been  
04:45:04 25 shown to reliably detect instances of

04:45:12 1 partisan gerrymandering and also to  
04:45:17 2 coincide with each other very closely,  
04:45:17 3 especially in competitive states like  
04:45:17 4 Pennsylvania. So as we're going to  
04:45:17 5 see in my analysis they essentially  
04:45:20 6 never disagree with each other at  
04:45:22 7 least a major way in their  
04:45:24 8 evaluations. There are very small  
04:45:27 9 discrepancies. They are --- they all  
04:45:28 10 coincide, so --- and that gives us  
04:45:33 11 confidence that they're all picking up  
04:45:36 12 on different aspects of the same  
04:45:36 13 concept which is partisan symmetry or  
04:45:43 14 partisan fairness.

04:45:43 15 Q. Dr. Caughey, could you describe  
04:45:44 16 the process you use to compare the  
04:45:46 17 maps?

04:45:46 18 A. Sure. So there is a sort of  
04:45:51 19 standard procedure that --- that is  
04:45:54 20 standard in the political science  
04:45:56 21 literature for --- political  
04:46:00 22 methodology for conducting these sorts  
04:46:04 23 of analyses of partisan fairness. So  
04:46:06 24 the first is to take the shape files  
04:46:11 25 of the districts and merge them with

04:46:13 1 whatever electoral and demographic  
04:46:21 2 data we have at the precinct level,  
04:46:25 3 right. Then using that data estimate  
04:46:26 4 or forecasting forward, right, you  
04:46:28 5 know you want to know how  
04:46:33 6 Congressional elections will be in the  
04:46:35 7 future of this map. So we're  
04:46:37 8 predicting a Congressional vote in  
04:46:39 9 each district as a function of the  
04:46:41 10 information that we have, plus the  
04:46:44 11 uncertainty in that prediction and  
04:46:47 12 that uncertainty --- so the way we do  
04:46:50 13 this is in political science is we  
04:46:51 14 pick what's called --- usually called  
04:46:53 15 a multilevel model where we are  
04:46:58 16 fitting this to the entire country's  
04:46:58 17 data, right, we have data on  
04:46:58 18 Congressional elections across the  
04:47:02 19 country and we also know things of how  
04:47:04 20 --- what the Presidential vote is in  
04:47:07 21 every congressional district. So we  
04:47:11 22 model, we try to predict ---  
04:47:13 23 Congressional vote is a function of  
04:47:14 24 things like incumbency and  
04:47:19 25 presidential vote. But also take into

04:47:19 1 account the specific idiosyncrasies of  
04:47:26 2 a given election, or a given state and  
04:47:26 3 then we use those --- the estimates of  
04:47:29 4 that model to project forward, okay.  
04:47:31 5 And the key thing is that when we make  
04:47:33 6 those projections we take into account  
04:47:38 7 the fact that in some years Democrats  
04:47:42 8 do very well and some years very  
04:47:44 9 poorly across the board. We also take  
04:47:47 10 into account the fact that the  
04:47:48 11 relationship between presidential vote  
04:47:48 12 and congressional vote can vary across  
04:47:49 13 states. And we also take into account  
04:47:52 14 that there is idiosyncratic variation  
04:47:55 15 across --- in a given race. In a race  
04:47:59 16 the candidate may run a very good  
04:48:00 17 campaign, a very poor campaign and  
04:48:02 18 that can affect the outcome of the  
04:48:05 19 election, too. So when we make these  
20 predictions, we take into account  
21 those various sources of uncertainty  
22 to come up with a realistic range of  
23 prediction for a given Congression  
24 election. So that's the basic  
25 methodology.

1 And then, so if you had  
2 infinite time, I would do that myself.  
3 But recently, you know, the Plans  
4 Score website which I think you have  
5 heard something about has developed  
6 --- has made it possible to do this  
7 exact procedure, to automate it and  
8 make it faster, more transparent to  
9 the public, which --- and so --- and I  
10 worked closely with the people who  
11 developed a methodology underlying  
12 Plan Score. Plan Score is very  
13 transparent about the methodology it  
14 uses. So I rely on plans for ---.  
15 Q. Doctor ---.  
16 A. What I actually did is I  
17 uploaded these map shape files to Plan  
18 Score and downloaded the prediction as  
19 a result of the process that I just  
20 described.  
21 Q. And Dr. Caughey, Plan Score is  
22 open to the public. It's publicly  
23 accessible.  
24 Correct?  
25 A. That's right. So it's publicly

04:49:21 1 accessible not just in that you can go  
04:49:26 2 it and look at scores for existing  
04:49:27 3 maps, but it has functionality for  
04:49:29 4 uploading chief files or proposed  
04:49:32 5 maps, even ones you, yourself, have  
04:49:35 6 come up with and scoring them  
04:49:37 7 according to partisan fairness. So  
04:49:41 8 that is a procedure that I used.

04:49:54 9 Q. Okay.

04:49:54 10 And if you haven't already  
04:49:56 11 covered it, could you just briefly  
04:49:56 12 cover the methodology and familiarity  
04:49:59 13 of the code related to Plan Score?

04:49:59 14 A. Sure. So one of things that  
04:50:01 15 distinguishes Plan Score from other  
04:50:01 16 websites that do gerrymandering or  
04:50:05 17 partisan fairness type analysis like  
04:50:08 18 538.com is that first of all, it's a  
04:50:10 19 non-profit and a non-partisan website.  
04:50:15 20 And second of all, it's entirely ---  
04:50:18 21 it's entirely transparent about the  
04:50:19 22 methodology underlying its assumption,  
04:50:24 23 underlying its predictions.

04:50:26 24 So it tells you what the data  
04:50:28 25 --- it tells you exactly what the



04:50:30 1 model is and how the model was fixed.  
04:50:33 2 And in fact, I've seen the code that  
04:50:37 3 was used. I emailed the people who  
04:50:44 4 created it and I was able to see the  
04:50:45 5 code myself. So I have a very  
04:50:47 6 intimate understanding. By code I  
04:50:48 7 mean the statistical software code  
04:50:50 8 that was done in a software program  
04:50:50 9 called R, which I'm very familiar  
04:50:55 10 with.

04:50:55 11 Q. Are you familiar with who  
04:50:56 12 created Plan Score?

04:50:57 13 A. Yeah. So different people  
04:50:57 14 worked on some aspects of it, the  
04:50:57 15 political scientists involved, who did  
04:50:57 16 the political science side of the work  
04:51:10 17 were primarily, as I understand, Eric  
04:51:13 18 McGee and Christopher Warshaw, both  
04:51:15 19 political scientists. And Chris  
04:51:18 20 Warshaw is my most closest  
04:51:21 21 academic ---.

04:51:22 22 Q. And that's the same Dr. Warshaw  
04:51:24 23 who's an expert in the League of Women  
04:51:29 24 Voters case in 2018?

04:51:29 25 A. Yes.

04:51:29 1 Q. And you started your analysis  
04:51:34 2 with the 2018 congressional map. I  
04:51:36 3 would like to discuss that with you.

04:51:37 4 A. Sure.

04:51:37 5 Q. And the graph associated with  
04:51:37 6 that is on page eight of your expert  
04:51:37 7 report which is attached in the Senate  
04:51:37 8 Democrat's reply brief that was filed  
04:51:56 9 in this case. Do you have page eight  
04:51:57 10 in front of you?

04:51:58 11 A. I do, yes.

04:51:59 12 Q. Could you go to that? And  
04:52:00 13 first off, before we discuss it, the  
04:52:03 14 2018 map can't be used in this case,  
04:52:08 15 because --- it can't be used going  
04:52:10 16 forward, because Pennsylvania has went  
04:52:11 17 from 18 seats to 17 seats. So why did  
04:52:15 18 you decide to do an analysis of the  
04:52:17 19 2018 map if it can't be selected as a  
04:52:21 20 map to resolve this litigation?

04:52:24 21 A. I think one very important  
04:52:26 22 reason I wanted to do it, is just to  
04:52:29 23 validate the approach and make sure  
04:52:31 24 that the predictions being generated  
04:52:32 25 by the model plans for uses, were

04:52:36 1 reasonable and well calibrated.

04:52:38 2 And sorry, my connection is  
04:52:45 3 flickering back and forth, but if you  
04:52:46 4 can still hear me, let me know.

04:52:48 5 Q. I can hear you, yes.

04:52:50 6 A. Okay.

04:52:52 7 And so I wanted to, first of  
04:52:57 8 all, just run it on the current map  
04:53:00 9 just to make sure that this is good  
04:53:01 10 statistical practice, right. If you  
04:53:03 11 have a model that's generating  
04:53:05 12 predictions, you want to compare it to  
04:53:11 13 some reasonable --- something that you  
04:53:12 14 know --- you want to compare something  
04:53:12 15 you know is right, something that has  
04:53:15 16 already happened right to validate it.

04:53:17 17 So in this case I was able to  
04:53:19 18 do that. So for example, in the  
04:53:27 19 average vote share predicted,  
04:53:30 20 according to Plan Score was rather  
04:53:32 21 than Republican vote share in U.S  
04:53:38 22 Congressional elections is predicted  
04:53:38 23 going forward to be on average  
04:53:39 24 51 percent.

04:53:41 25 And then what was reassuring

04:53:42 1 what that that's actually the same,  
04:53:43 2 not only --- that's the same as the  
04:53:45 3 actual vote share that Republicans  
04:53:48 4 received in 2020, but also the same as  
04:53:52 5 the average share that they received  
04:53:54 6 over the entire 2010 to 2020 period.

04:53:58 7 So that reassures me that this  
04:54:02 8 is a reasonable prediction, although  
04:54:06 9 one of course, that is accompanied by  
04:54:09 10 uncertainty.

04:54:20 11 Q. And can you take us to your  
04:54:22 12 graph on page eight and walk us  
04:54:24 13 through what you're seeing there?

04:54:26 14 A. Sure. This graph lines up all  
04:54:29 15 districts ordered by how Republican  
04:54:31 16 they are. So on the far left side of  
04:54:33 17 the screen you have the most  
04:54:36 18 Democratic district, which is District  
04:54:42 19 3. It won't surprise you to learn is  
04:54:43 20 in Philadelphia, and then increasing  
04:54:46 21 order of the prediction of how  
04:54:51 22 Republicans that each District is  
04:54:52 23 likely to be.

04:54:53 24 So you'll notice that they  
04:54:55 25 change color halfway through. That's

04:54:58 1 the --- if the prediction is above  
04:55:00 2 50 percent, I colored it red. If the  
04:55:04 3 prediction is below 50 percent I  
04:55:06 4 colored it blue. You'll also notice  
04:55:08 5 that there are these vertical lines  
04:55:13 6 around each dot, and the dot refers to  
04:55:15 7 what one might consider our best  
04:55:16 8 guess. But the vertical lines are an  
04:55:18 9 indication of how uncertain we are  
04:55:21 10 about that guess. And in particular,  
04:55:22 11 they represent the one standard  
04:55:25 12 deviation up or down.

04:55:28 13 Standard deviation is just a  
04:55:30 14 way of saying that's like the typical  
04:55:33 15 amount that we would expect to be off  
04:55:35 16 in our guess. That might be one way  
04:55:36 17 of thinking about it. So you can see  
04:55:38 18 that especially for, you know, for  
04:55:41 19 several of the closer districts these  
04:55:46 20 predictions are predicted to be wrong,  
04:55:48 21 close to 50 percent of the time,  
04:55:50 22 right, because we are highly uncertain  
04:55:52 23 about exactly how they're going to  
04:55:53 24 land, depending on idiosyncratic  
04:55:56 25 factors in that race as well as shifts

04:55:59 1 across the election.

04:56:00 2 Q. Are you referring to the

04:56:01 3 districts identified on the graph with

04:56:04 4 number 1, 7, 17 and 10?

04:56:10 5 A. Yes. Those were the closest

04:56:12 6 districts, yes.

04:56:12 7 Q. Okay.

04:56:14 8 And do you have a dotted line

04:56:17 9 going across horizontally the

04:56:19 10 50 percent mark.

04:56:20 11 Correct?

04:56:21 12 A. Yeah. Yes, I do.

04:56:27 13 Q. And could you just discuss that

04:56:28 14 and how it interacts with the vertical

04:56:32 15 lines, specifically in the example you

04:56:35 16 gave in Districts 1, 7, 17 and 10?

04:56:39 17 A. Right. So if you notice in

04:56:41 18 each of those --- so the 50 percent

04:56:43 19 line represents if a --- if the

04:56:46 20 prediction falls above that line, then

04:56:51 21 we predict the Republicans will carry

04:56:51 22 that district, or a Republican will

04:56:53 23 carry that district. And if it falls

04:56:54 24 below we would expect the Democrats to

04:56:54 25 carry.

04:57:02 1 All of the districts that we  
04:57:02 2 just mentioned 1, 7, 17, 10 all are  
04:57:05 3 close enough to that line that there's  
04:57:09 4 substantial uncertainty about where  
04:57:11 5 they will land, right.

04:57:13 6 In other words, they're the ---  
04:57:15 7 even if we say that our best guess is  
04:57:17 8 that this will be a Democratic  
04:57:20 9 district, say, for 7 we predict that  
04:57:24 10 if we had to guess, we would say that  
04:57:27 11 about have be won by a Democrat, and  
04:57:29 12 we would also say about that half of  
04:57:31 13 the time or almost half the time we  
04:57:34 14 will be wrong about that, because  
04:57:40 15 almost half of that vertical line is  
04:57:41 16 of the other side.

04:57:42 17 Q. And that's referring to the  
04:57:43 18 close congressional districts 1, 7, 17  
04:57:48 19 and 10.

04:57:48 20 Correct?

04:57:50 21 A. At that particular case I was  
04:57:51 22 thinking about District 7 as an  
04:57:51 23 example, but it applies to all of it.

04:57:52 24 Q. And your motto is a no  
04:57:56 25 incumbency model.

04:57:58 1 A. That's right.

04:57:58 2 Q. Can you just explain what it  
04:58:01 3 means?

04:58:02 4 A. Right. So perhaps one of the  
04:58:03 5 best established findings in political  
04:58:06 6 science is that a party's vote share  
04:58:09 7 tends to be higher in congressional  
04:58:13 8 elections, when they have an incumbent  
04:58:15 9 running for office, right? Because  
04:58:18 10 for a variety of reasons.

04:58:19 11 When we're predicting going  
04:58:21 12 forward we have to decide are we going  
04:58:23 13 to --- what scenario are we going to  
04:58:25 14 imagine. Are we going to imagine an  
04:58:27 15 open seat scenario. And that seems to  
04:58:30 16 be the standard thing to do.

04:58:32 17 Let's predict how the party  
04:58:35 18 would do if neither --- how the  
04:58:37 19 parties would do, how the election  
04:58:39 20 would turn out, if neither party had  
04:58:42 21 an incumbent in the race or neither  
04:58:44 22 party had an incumbency advantage  
04:58:46 23 here, but in order to do that we would  
04:58:47 24 have to, obviously estimate what  
04:58:49 25 typical incumbency advantage is and



04:58:52 1 subtract that from the --- basically  
04:58:54 2 account for that in our model of  
04:58:58 3 non-predicted model. So in this case  
04:59:00 4 we're projecting what would happen in  
04:59:03 5 these cases if no incumbents were  
04:59:05 6 running.

04:59:05 7 Q. Okay.

04:59:06 8 And just going back to your  
04:59:07 9 graph here very quickly. Looking at  
04:59:12 10 4, 6, 1, 7, 17, 10, 8 and then 16, it  
04:59:20 11 looks slightly like mirror images to  
04:59:22 12 some degree, is that symmetry --- how  
04:59:24 13 does that relate to symmetry when you  
04:59:27 14 talk to us about symmetry?

04:59:29 15 A. Right. So you know, this isn't  
04:59:36 16 exactly a vote seats curve, so it's  
04:59:40 17 not literally what partisan symmetry  
04:59:42 18 measure is characterizing, but what it  
04:59:45 19 does show is that if you moved ---  
04:59:46 20 because the distribution there, is  
04:59:52 21 symmetric around say the --- the  
04:59:55 22 district that you mentioned look  
04:59:56 23 similar to each other in terms of how  
04:59:59 24 far they are from 50 percent on either  
04:59:59 25 side.

05:00:04 1 If you move the line up by one  
05:00:09 2 percent that would mean that Democrats  
05:00:10 3 were doing one percent better and they  
05:00:11 4 would capture --- you know, if they it  
05:00:12 5 one percent they capture one district.  
05:00:13 6 If you move it up five percent, they  
05:00:14 7 would capture two more districts  
05:00:17 8 beyond that. And the same is true if  
05:00:20 9 you lower the Democratic vote,  
05:00:22 10 something similar.

05:00:23 11 So what that means is that the  
05:00:25 12 amount of additional districts that a  
05:00:28 13 party could expect to earn based on an  
05:00:28 14 increase of their vote share by one  
05:00:33 15 percent or five percent across the  
05:00:35 16 board is roughly the same between the  
05:00:38 17 two parties, that's what symmetry  
05:00:39 18 means. Right. It means that what ---  
05:00:42 19 the seats you earn from given vote  
05:00:47 20 share are close to identical.

05:00:51 21 Q. And Doctor, you have a table,  
05:00:54 22 Table 1 on page nine of your report.

05:00:55 23 A. Sure.

05:00:56 24 Q. Could you go to that table and  
05:00:58 25 quickly summarize for us what we're

05:01:00 1 seeing there?

05:01:04 2 A. Sure. So there are a lot of  
05:01:06 3 numbers here, but the first thing to  
05:01:08 4 know is on the far left column where  
05:01:09 5 it says metric, that part identifies  
05:01:13 6 what measure are we talking about  
05:01:18 7 here. There's the partisan bias,  
05:01:21 8 there's the efficiency gap, there's  
05:01:21 9 the mean median and the declination.  
05:01:24 10 And recall of these are trying to tap  
05:01:25 11 into the same thing, which is how much  
05:01:28 12 does this map deviate from partisan  
05:01:30 13 fairness. How unfair is it. And  
05:01:33 14 across the board here, higher numbers  
05:01:35 15 are indicating more bias in a  
05:01:37 16 Republican direction, okay.

05:01:41 17 Some positive numbers are  
05:01:43 18 complicated for Republican bias and  
05:01:45 19 negative numbers are for Democratic  
05:01:48 20 bias, and so that --- each row  
05:01:54 21 corresponds to a different measure and  
05:01:54 22 for each measure we do the same thing.  
05:01:56 23 The first --- the columns that's  
05:01:57 24 predicted value that --- that's our  
05:02:00 25 best guess for how --- according to

05:02:02 1 this measure of what the bias is or  
05:02:04 2 what the advantage to Republicans are.

05:02:07 3 So for example, for the  
05:02:09 4 partisan bias the predicted partisan  
05:02:12 5 bias is 2.1 percent. What does that  
05:02:15 6 mean? That means that in an election  
05:02:18 7 where both parties get exactly  
05:02:22 8 50 percent of the vote, in other words  
05:02:24 9 they tie statewide. Because they're  
05:02:27 10 tying there's no winner, there's no  
05:02:29 11 winners bonus, right? So any  
05:02:30 12 difference between the vote share that  
05:02:32 13 they receive, the vote and the seat  
05:02:35 14 chair they receive, represents the  
05:02:37 15 bias in favor of the advantaged party.

05:02:40 16 So here 2.1 means that  
05:02:42 17 Republicans are predicted to win  
05:02:46 18 52.1 percent of seats on average when  
05:02:51 19 the two parties win 50 percent. Each  
05:02:54 20 both win 50 percent of the vote. So  
05:02:56 21 that's what we're doing down that  
05:02:59 22 column, unpredicted value, we're just  
05:02:59 23 saying that's our best guess going  
05:03:05 24 forward for what each of these metrics  
05:03:05 25 is.

05:03:05 1 Would you like me to go through  
05:03:07 2 the rest of the columns as well or is  
05:03:16 3 that ---?

05:03:16 4 Q. I think we're going to move on.  
05:03:17 5 Let us know briefly what you wanted to  
05:03:17 6 share about the rest of the columns  
05:03:17 7 and then we're going to move on to  
05:03:22 8 Governor Wolf's matter.

05:03:25 9 A. Sure. The rest of the columns  
05:03:27 10 are just --- the one that is called  
05:03:27 11 prod GOP advantage, that's like ---  
05:03:31 12 how sure are we that this map bias  
05:03:34 13 favors Republican party as opposed to  
05:03:36 14 the Democrat.

05:03:37 15 And you see across the board we  
05:03:39 16 are about 70 percent sure, about  
05:03:41 17 70 percent of simulated elections that  
05:03:44 18 will favor the --- the Republicans by  
05:03:46 19 30 percent, Democrats. But the  
05:03:49 20 advantage and that --- that's a  
05:03:50 21 reflection of what we discussed  
05:03:52 22 earlier, which is the actual bias can  
05:03:54 23 depend somewhat on what exactly the  
05:04:09 24 vote share ends up being. Who ends up  
05:04:09 25 --- for example, who ends up winning

05:04:09 1 those very narrowly contested  
05:04:09 2 districts.  
05:04:09 3 That being said --- so that's  
05:04:10 4 the probability to the advantage. The  
05:04:10 5 remaining two columns are measures of  
05:04:13 6 how severe or how extreme this bias is  
05:04:16 7 relative to other plans that have been  
05:04:19 8 scored in other states, other enacted  
05:04:23 9 plans historically. And in  
05:04:27 10 Pennsylvania. So all the plans that  
05:04:27 11 have ever been enacted and all the  
05:04:31 12 enacted plans that have ever been  
05:04:33 13 scored by Plan Score, how unusual is  
05:04:37 14 this, how bad is this, where higher  
05:04:40 15 numbers are. This is really pretty  
05:04:42 16 bad. And so in this case it's not  
05:04:45 17 that bad. So that yes, this is a  
05:04:50 18 slightly Republican leaning map, but  
05:04:54 19 it --- you know, only compared to the  
05:04:55 20 existing --- the distribution of other  
05:04:58 21 maps, it's, you know --- it's more  
05:05:06 22 Republican than about 65 percent  
05:05:07 23 maybe, and it's less bias in absolute  
05:05:10 24 terms than about three-quarters of  
05:05:13 25 those maps. That is the final column.

05:05:15 1 Q. Okay.

05:05:16 2 A. How many --- now, so the  
05:05:17 3 important thing --- one thing to keep  
05:05:19 4 in mind though, this is comparing this  
05:05:21 5 map to the observed distribution,  
05:05:25 6 historical distribution of the  
05:05:29 7 efficiency gap, which is not  
05:05:30 8 necessarily fair.

05:05:32 9 You know, there has been  
05:05:32 10 gerrymandering in the past. So this  
05:05:34 11 includes cases of gerrymandering in  
05:05:36 12 the nominator, but it does give a  
05:05:38 13 sense of just how much of an outlier  
05:05:40 14 is this map.

05:05:41 15 Q. And Doctor Caughey, with that  
05:05:43 16 I'm going to move you onto Governor  
05:05:43 17 Wolf's map, which the graph is located  
05:05:43 18 on page 11. Could you just walk us  
05:05:55 19 through the graph on page 11 and let  
05:05:57 20 us know what you view as significant  
05:05:58 21 there related to partisan fairness.

05:06:00 22 A. Sure. I think the most  
05:06:00 23 important thing to note about Governor  
05:06:11 24 Wolf's map is, it's very similar to  
05:06:12 25 the --- in terms of its partisan

05:06:15 1 fairness score it's very similar to  
05:06:17 2 the current.

05:06:18 3 Like, there are small details  
05:06:19 4 here and there, so you'll notice, for  
05:06:21 5 example, that there is --- instead of  
05:06:27 6 there being one highly Democratic  
05:06:30 7 district, District 3, now there are  
05:06:34 8 more like two, which is District 3 and  
05:06:34 9 2.

05:06:38 10 But overall in terms of what we  
05:06:41 11 would expect to happen, we respect the  
05:06:44 12 partisan bias is slightly larger on  
05:06:49 13 Governor Wolf's map than in the  
05:06:50 14 current map, but in the same ballpark.  
05:06:53 15 It's like --- for example, it's 2.9  
05:06:57 16 percent. So what that's saying is if  
05:06:59 17 Republicans win 50 percent of the  
05:07:01 18 vote, we would expect them to win 52.9  
05:07:05 19 percent of seats on average, which is  
05:07:06 20 about --- I can't do it off the top of  
05:07:07 21 my head, one additional seat.

05:07:11 22 And so that is pretty close to  
05:07:17 23 fair, but not completely. It is very  
05:07:19 24 similar to the existing map.

05:07:23 25 Q. And I'm going to move you onto



05:07:27 1 the House Republican map, which has  
05:07:29 2 been referred to as HB-2146, and your  
05:07:32 3 graph for that map is located on  
05:07:34 4 page 14 of your report.

05:07:37 5 A. Yes.

05:07:38 6 Q. Could you please go there, Dr.  
05:07:41 7 Caughey, and tell us what this graph  
05:07:43 8 is communicating about partisan  
05:07:46 9 fairness?

05:07:49 10 A. Sure. So one of the things we  
05:07:53 11 should just note is that to cross all  
05:07:55 12 these maps with the predicted  
05:07:58 13 Republican vote share is always  
05:08:00 14 51 percent, right, that is what the  
05:08:02 15 model says on average what we would  
05:08:05 16 expect Republicans to win in terms of  
05:08:06 17 votes in congressional elections.

05:08:08 18 And so the only difference  
05:08:09 19 across these maps is how these votes  
05:08:12 20 are allocated across districts. So  
05:08:15 21 you'll notice in the previous two  
05:08:17 22 maps, under that scenario, under the  
05:08:19 23 average scenario where Republicans win  
05:08:22 24 51 percent of votes they are predicted  
05:08:25 25 to win 55 percent of seats. That is

05:08:29 1 super proportional, but that's not  
05:08:29 2 uncommon given a winner's vote of ---  
05:08:33 3 you know, pretty standard winner's  
05:08:34 4 bonus, maybe a little larger than  
05:08:36 5 usual. That is under the previous  
05:08:39 6 first two maps we looked at.

05:08:41 7 This map, the winner bonus is  
05:08:44 8 quite larger, we notice that  
05:08:46 9 51 percent of the vote Republicans are  
05:08:50 10 predicted to win 58 percent of seats,  
05:08:56 11 so that's a three extra point seat  
05:08:58 12 here relative to the other two maps.  
05:09:01 13 And you can see that same kind of  
05:09:04 14 three percent --- three percentage  
05:09:08 15 point additional bias. It shows up  
05:09:09 16 also --- I'm sorry, I was going to  
05:09:11 17 scroll down to the table, the  
05:09:12 18 resulting table below.

05:09:14 19 Go ahead. I don't want to skip  
05:09:17 20 ahead.

05:09:17 21 Q. Please go to the table and I'll  
05:09:19 22 bring you back to the graph if I need  
05:09:23 23 you there.

05:09:24 24 A. Sure. Sounds good. You can  
05:09:25 25 see that same three percent

05:09:27 1 additional, you know, bonus for  
05:09:28 2 Republicans in, for example, the  
05:09:31 3 partisan bias. So again, here the  
05:09:34 4 partisan bias is 6.3 percent, right.

05:09:37 5 So in the previous two maps we  
05:09:39 6 looked at, the current map and the  
05:09:41 7 Governor's map, the partisan bias was  
05:09:44 8 under three, right. 6.3, that means  
05:09:50 9 in a tied election Republicans would  
05:09:52 10 expect to win 56 percent of seats on  
05:09:55 11 average, right.

05:09:59 12 And you'll also notice that ---  
05:10:01 13 okay, you can take me back if you  
05:10:03 14 want. So that's about double the  
05:10:06 15 advantage, say the bias is about  
05:10:09 16 double than what the current map is  
05:10:11 17 and also the Governor's proposal.

05:10:14 18 Q. I do want to ask you a few more  
05:10:16 19 questions about the graph?

05:10:17 20 A. Sure.

05:10:17 21 Q. On the graph, you agree there  
05:10:20 22 are ten red dots that are above the  
05:10:24 23 dotted line and then seven blue dots  
05:10:28 24 that are below the dotted line.

05:10:30 25 Correct?

05:10:34 1 A. That's right.

05:10:35 2 Q. Tell us what that represents.

05:10:36 3 A. So that means that if we based

05:10:39 4 our prediction on --- so if we wanted

05:10:43 5 to guess --- for every District if we

05:10:46 6 wanted to guess one best guess about

05:10:49 7 whether Democrat or Republican

05:10:51 8 District, we would predict that 10 out

05:10:53 9 of the 17 districts would go

05:10:55 10 Republican.

05:10:56 11 Now some of those are close

05:10:58 12 and ---.

05:11:00 13 Q. Dr. Caughey, let's talk about

05:11:04 14 that closeness.

05:11:05 15 A. Go ahead.

05:11:06 16 Q. If you take that dotted line at

05:11:08 17 50 percent and you move it down just a

05:11:11 18 little bit then number one and number

05:11:13 19 six, they would be above the dotted

05:11:14 20 line and become red.

05:11:16 21 A. That's right.

05:11:17 22 Q. Can you explain what that

05:11:19 23 means?

05:11:20 24 A. So that means that in a year

05:11:22 25 where Republicans do a little better

05:11:24 1 than average, so they do about two  
05:11:29 2 percentage points better than average,  
05:11:31 3 meaning they win 53 percent of the  
05:11:34 4 vote, they would likely capture on the  
05:11:38 5 Democratic --- currently Democratic  
05:11:43 6 districts 1 and 6.

05:11:45 7 Q. Okay.

05:11:46 8 A. And that's --- you know, so  
05:11:47 9 just for a frame of reference, that's  
05:11:49 10 --- you know, in 2016 for example,  
05:11:51 11 Republicans won 54 percent of the  
05:11:59 12 two-party vote in congressional  
05:12:02 13 elections in Pennsylvania. So that  
05:12:02 14 would be --- if 2016 happened all over  
05:12:03 15 again they would probably capture 1  
05:12:06 16 and 6.

05:12:08 17 Q. Okay.

05:12:08 18 And Dr. Caughey, is that  
05:12:11 19 significant with respect to your  
05:12:12 20 conclusions for partisan fairness on  
05:12:14 21 this particular map?

05:12:22 22 A. So what I would say is that in  
05:12:24 23 this particular --- in this particular  
05:12:26 24 map there are more --- so what I would  
05:12:33 25 say the key pattern that I would draw

05:12:36 1 attention to in this map is the fact  
05:12:39 2 that there are all but 1 and 6. There  
05:12:44 3 are a lot of highly Democratic  
05:12:46 4 districts, right, districts where not  
05:12:49 5 only --- I mean, obviously the most  
05:12:51 6 extreme is District 3, as it is in all  
05:12:55 7 the maps.

05:12:56 8 But there are also a number of  
05:12:58 9 --- several --- there are four other  
05:13:00 10 districts where Democratic are  
05:13:01 11 predicted to win over 60 percent of  
05:13:04 12 the vote and Republicans are predicted  
05:13:06 13 to win under 40 percent, right, so  
05:13:12 14 that's 5, 4, 15 and 2. Right? So  
05:13:12 15 that's outside of the normal range of  
05:13:18 16 being captured. So those are --- so  
05:13:18 17 those are --- those are seats where  
05:13:18 18 there are a fair number of --- in  
05:13:21 19 addition to the wasted votes in  
05:13:22 20 District 3 there are a bunch of other  
05:13:25 21 --- four other seats where there are a  
05:13:28 22 lot of Democratic wasted votes, right?  
05:13:36 23 The Democrats are leading very  
05:13:38 24 comfortable --- are likely to be very  
05:13:38 25 comfortable in all the seats in almost

05:13:40 1 every election.

05:13:41 2 Where you just --- if you look  
05:13:42 3 on the other side, there just is no  
05:13:44 4 equivalently one-sided seat on the  
05:13:47 5 Republican side. But there are a lot  
05:13:50 6 of --- it would be hard for Democrats  
05:13:54 7 to break through the Republicans in  
05:13:58 8 the firewall in a good year for  
05:14:00 9 Democrats.

05:14:01 10 Q. And when you say it would be  
05:14:03 11 hard for Democrats to break through in  
05:14:06 12 a good year for Democrats, does that  
05:14:10 13 also hold true for Republicans in this  
05:14:13 14 map?

05:14:14 15 A. Not as much, right, because  
05:14:16 16 there are two districts that would be  
05:14:18 17 captured --- so you can think about  
05:14:20 18 the typical variation across election  
05:14:22 19 cycles is about three percentage votes  
05:14:27 20 here and there --- here or there, one  
05:14:28 21 way or the other. So in a typical  
05:14:29 22 one, the Democrats would capture 1 and  
05:14:31 23 6 --- or I'm sorry, the Republicans 1  
05:14:33 24 and 6 in a normal good year for  
05:14:37 25 Republicans, but there's only really

05:14:39 1 --- 7 is the only District --- the  
05:14:43 2 only Republican District that's  
05:14:44 3 especially vulnerable to being taken  
05:14:48 4 over by Democrats. Even though there  
05:14:49 5 is some probability of 17 and 8 in a  
05:14:52 6 very Democratic year.  
05:14:55 7 Q. So in a vote share of 53 or  
05:14:58 8 54 percent, the Republicans would have  
05:14:59 9 a proportional share of 12 seats ---  
05:15:02 10 A. That's right.  
05:15:03 11 Q. --- and Democrats would have 5?  
05:15:06 12 A. Yeah. And I don't know that --  
05:15:06 13 I'm not going to do that percentage  
05:15:13 14 off the top of my head, but that would  
05:15:13 15 be an unusually large winner's bonus.  
05:15:15 16 Q. And that winner's bonus you  
05:15:18 17 just described for Republicans in this  
05:15:19 18 map, it is not the same winner's bonus  
05:15:24 19 that exists for Democrats in the map?  
05:15:27 20 Right?  
21 A. That's right. That's right.  
22 So ---.  
23 Q. And ---?  
24 A. Yes, I could --- it's a little  
25 hard for ---.



05:15:28 1 Q. Well, Dr. Caughey, ---.

05:15:28 2 ATTORNEY ATTISANO:

05:15:31 3 Judge, I apologize for

05:15:31 4 interrupting.

05:15:33 5 BY ATTORNEY ATTISANO:

05:15:33 6 Q. I'm going to move you on to

05:15:35 7 Senate Democratic maps 1 and 2 --- and

05:15:39 8 we have about ten minutes left, so I'm

05:15:44 9 going to move them a little quicker

05:15:45 10 than before. Okay?

05:15:45 11 A. I will do my best.

05:15:46 12 Q. And page 17 of your report has

05:15:49 13 the Senate Democrats map 1.

05:15:53 14 A. Yeah.

05:15:53 15 Q. Can you take us through quickly

05:15:55 16 what we're looking at here that is

05:15:57 17 relevant to determining partisan

05:15:58 18 fairness?

05:16:00 19 A. So I think that the --- once

05:16:03 20 again, I think the key takeaway from

05:16:08 21 this, this map, is --- or this

05:16:11 22 distribution is that once again the

05:16:12 23 predicted Republican vote share is

05:16:14 24 51 percent and the predicted

05:16:17 25 Republican seat share is 54 percent.

05:16:21 1 So the Republicans are predicted to  
05:16:23 2 win a majority of seats in the typical  
05:16:26 3 election.

05:16:27 4 But notice that winner's bonus  
05:16:31 5 is low. Right? And that's in part  
05:16:32 6 because they have more seats that are  
05:16:35 7 in play, right? They have 1, 7, 8 and  
05:16:39 8 10 that could reasonably, even through  
05:16:40 9 they're predicted to win them,  
05:16:40 10 probably in any given election given  
05:16:42 11 the right combination of candidates,  
05:16:43 12 at least one of those might flip over  
05:16:46 13 to the Democrats. So the Democrats  
05:16:49 14 have a better chance of getting closer  
05:16:49 15 to parity in your typical election.  
05:16:56 16 And you can see the same thing  
05:16:58 17 probably more clearly in the partisan  
05:17:01 18 bias measure, which is only 1.8 in  
05:17:06 19 this map. And that means that ---.

05:17:09 20 Q. And that's ---.

05:17:09 21 A. Sorry. This is ---.

05:17:10 22 Q. That's located in Table ---  
05:17:12 23 Table 4 on the following page, page  
05:17:14 24 18. Please go ahead, Dr. Caughey?

05:17:14 25 A. Right.

05:17:21 1 So the --- so in a 50/50  
05:17:24 2 election Republicans would be expected  
05:17:26 3 to win just about 52 percent of seats,  
05:17:28 4 51.8 percent of seats on average,  
05:17:29 5 right. So that's a --- that's a ---  
05:17:32 6 that's still a little bit of  
05:17:34 7 Republican advantage, because we still  
05:17:37 8 expect Republicans to have a majority  
05:17:39 9 of seats even when the parties tie.  
05:17:40 10 But it's less of an advantage than in  
05:17:45 11 any of the previous seats that we've  
05:17:46 12 seen.

05:17:47 13 Q. And Dr. === and Dr. Caughey,  
05:17:48 14 let's move forward to Senate Democrats  
15 Map Number 2, which is located on page  
16 20, the graph that I'm referring you  
17 to. And can you tell us what we're  
18 seeing there in that graph related to  
19 bipartisan fairness?

05:18:08 20 A. Sure. So the top line results  
05:18:08 21 are identical, which is to say that  
05:18:11 22 with 51 percent of the vote  
05:18:11 23 Republicans would be expected to win  
05:18:12 24 54 percent of seats, which ties for  
05:18:18 25 the lowest closest to fair of all the

05:18:19 1 maps that we have considered or that  
05:18:22 2 the only known real difference in, you  
05:18:24 3 know, --- and as you look at measures  
05:18:26 4 of bipartisan bias, it's similar ---  
05:18:27 5 the bipartisan bias in this map is  
05:18:30 6 actually even a little bit smaller.  
05:18:32 7 But the --- I think --- you know, ---  
05:18:35 8 and there is a difference in the way  
05:18:37 9 that --- there are differences in the  
05:18:39 10 way that the districts are  
05:18:40 11 distributed. So in here there are  
05:18:41 12 actually two pretty Democratic  
05:18:44 13 districts, but a bunch of only  
05:18:44 14 moderately Republican --- Democratic  
05:18:48 15 ones.  
05:18:48 16 Q. And Dr. Caughey, ---  
05:18:50 17 A. Go ahead.  
05:18:51 18 Q. Dr. Caughey, sorry, in Table 5,  
05:18:52 19 the bipartisan bias you said is  
05:18:54 20 1.5 percent.  
05:18:54 21 A. Right.  
05:18:55 22 Q. Is that correct?  
05:18:58 23 A. Yes.  
05:18:58 24 Q. Okay.  
05:18:59 25 And I interrupted you there.

05:19:02 1 So if you have anything else to  
05:19:03 2 conclude on that map, please conclude  
05:19:07 3 and then I'm going to move you on to  
05:19:07 4 the next map?

05:19:07 5 A. Sure.

05:19:07 6 That's all I have to say about  
05:19:08 7 this, other than to say that it's very  
05:19:10 8 similar to the other Democratic map in  
05:19:14 9 terms of its overall bias towards one  
05:19:16 10 party or the other.

05:19:16 11 Q. Okay.

05:19:18 12 So, we're moving on now to  
05:19:19 13 Congressman Reschenthaler's plan, and  
05:19:21 14 that's map 2, as we discussed earlier.

05:19:21 15 A. Yeah.

05:19:26 16 Q. And it is on page 24 of your  
05:19:28 17 report.

05:19:29 18 Can you take us through what  
05:19:31 19 you're seeing on that chart?

05:19:32 20 A. Yeah, I think --- you know, so  
05:19:33 21 this is, again, similar to the House  
05:19:37 22 Republican's map, it has a very strong  
05:19:41 23 Republican bias.

05:19:42 24 You can see that first and  
05:19:46 25 foremost in the predicted vote in seat

05:19:48 1 shares, so 51 percent vote, 58 percent  
05:19:50 2 seat share. One reason for that is  
05:19:52 3 that even the districts that are  
05:19:53 4 predicted to be Democratic, 12, 11 and  
05:19:58 5 15, three --- they are three very  
05:20:03 6 narrowly Democratic districts, but  
05:20:03 7 only narrowly Republican one.

05:20:05 8 So if the you look down at  
05:20:06 9 Table 8, which is on the same page  
05:20:09 10 here, the bipartisan bias is 5.9.  
05:20:13 11 That's in the same ballpark as the  
05:20:15 12 Republican map that we examined  
05:20:20 13 earlier.

05:20:20 14 So in terms of overall partisan  
05:20:24 15 bias, this is very similar to  
05:20:27 16 Republican map where the bias is about  
05:20:27 17 twice as large as in the current  
05:20:31 18 assessment.

05:20:31 19 Q. And if the dotted line at  
05:20:33 20 50 percent, if we move that down a  
05:20:37 21 little bit, does that represent a vote  
05:20:39 22 increase for Democrats or Republicans?

05:20:41 23 A. If we move it down that  
05:20:43 24 represents a vote increase for  
05:20:45 25 Republicans. Or another way to think

05:20:50 1 about is if we move --- yeah. Yeah.

05:20:50 2 We can also think about it as moving

05:20:52 3 all the districts all up by three

05:20:54 4 percent. That might be --- that might

05:20:55 5 be an easier way of thinking about it.

05:20:56 6 But if we did that ---.

05:20:56 7 Q. What happens ---?

05:20:56 8 A. Yeah.

05:20:59 9 Q. Yeah, sorry, I interrupted you.

05:20:59 10 I think you were going to answer it.

05:21:02 11 What happens when we move all

05:21:04 12 the districts up by three percent to

05:21:07 13 the proportionality of Republican

05:21:14 14 versus Democrats seats with this map?

05:21:17 15 A. Yeah, so it's --- then you have

05:21:17 16 three seats, 15, 11 and 12 that are

05:21:20 17 likely to flip, or at least where our

05:21:22 18 point predictions would --- our best

05:21:22 19 guess about whether it would be

05:21:22 20 Republican or Democrat --- would flip

05:21:22 21 from Democrat to Republican.

05:21:26 22 So what that means is that, you

05:21:29 23 know, three of the Democrats --- what

05:21:36 24 is it, eight seats are highly

05:21:37 25 vulnerable to a Republican takeover.

05:21:38 1 Q. Is that same --- is that the  
05:21:38 2 same in the other direction?

05:21:41 3 A. No, not at all. I mean,  
05:21:42 4 there's a big asymmetry at that --- in  
05:21:46 5 those districts where there are very  
05:21:49 6 few Republicans districts that are  
05:21:50 7 vulnerable, realistically vulnerable  
05:21:52 8 to the Democratic takeover. There are  
05:21:54 9 just --- if you just look at Districts  
05:21:56 10 8 through 5 --- or let's say, 9  
05:21:58 11 through 5, all the way down, are all,  
05:22:01 12 you know, safely Republican, but not  
05:22:03 13 over --- not so overwhelming that  
05:22:04 14 you're wasting very many votes.

05:22:15 15 Q. And Dr. Caughey, I'm going to  
05:22:16 16 move you on now.

05:22:16 17 Did you review the report or  
05:22:16 18 hear any of the testimony of Dr.  
05:22:19 19 Barber?

05:22:19 20 A. So unfortunately I wasn't able  
05:22:22 21 to see his testimony, but I did read  
05:22:25 22 his report.

05:22:25 23 Q. And in his report he purported  
05:22:28 24 there was a geographic bias in  
05:22:35 25 Pennsylvania for Republicans, yet his



05:22:37 1 report claimed that the House GOP map,  
05:22:39 2 HB-0246 actually had a --- leaned  
05:22:39 3 Democrat, was favorable to Democratic  
05:22:44 4 seats. How can this be? Can you ---?  
05:22:46 5 A. Well, there's a little bit of a  
05:22:46 6 bait and switch there. I think one  
05:22:49 7 thing that is not transparent in that  
05:22:50 8 report, and I don't think it's  
05:22:52 9 mentioned anywhere, is --- so he uses  
05:22:56 10 --- he has to come up what's his  
05:23:01 11 prediction for how --- for the  
05:23:03 12 Democratic or Republican vote  
05:23:05 13 statewide, right? And so he does that  
05:23:08 14 using an average of statewide races  
05:23:13 15 over the last decade. Now those are a  
05:23:13 16 bunch of races --- that includes a  
05:23:16 17 bunch of races where Democrats are  
05:23:16 18 incumbents and did very well, right?  
05:23:18 19 So on average, based on my just  
05:23:22 20 kind of --- he never states anywhere  
05:23:23 21 in the report, as far as I can tell,  
05:23:24 22 what his actual prediction is, like  
05:23:28 23 for Democratic vote share. But based  
05:23:32 24 on sort of my comparison between where  
05:23:34 25 his districts lie and where I predict

05:23:37 1 them to lie, I think they're across  
05:23:39 2 the board about three percentage  
05:23:41 3 points more Democratic than I would  
05:23:43 4 predict. So what that means is that  
05:23:46 5 he's saying I'm predicting that  
05:23:48 6 Democrats are going to win 54 percent  
05:23:52 7 of the congressional vote on average  
05:23:55 8 going forward, but they're going to  
05:23:58 9 win --- well, he goes back and forth  
05:24:01 10 between 8 and 9 seats. Right?  
05:24:03 11 Q. So, Dr. --- so Dr. Caughey,  
05:24:06 12 does it matter which elections an  
05:24:09 13 expert selects to use in their  
05:24:10 14 dataset? Does it matter with respect  
05:24:12 15 to the ultimate outcome they get?  
05:24:15 16 A. Yes, definitely. So it matters  
05:24:18 17 for two reasons. It matters both in  
05:24:18 18 what you predict the outcome to be,  
05:24:18 19 obviously, like how many seats --- how  
05:24:25 20 many seats you project a party to win.  
05:24:28 21 Also it matters what you estimate the  
05:24:33 22 bias to be.  
05:24:33 23 Q. And ---.  
05:24:35 24 A. Go ahead.  
05:24:36 25 Q. And Dr. Caughey, if you could

05:24:39 1 tie that into how the Plan Score  
05:24:42 2 accounts for this?  
05:24:42 3 A. Sure. So Plan Score is a much  
05:24:45 4 --- you know, instead of sort of  
05:24:46 5 naively saying --- instead of doing  
05:25:06 6 that ---.  
05:25:06 7 Q. Dr. Caughey, I apologize. You  
05:25:06 8 had cut out. Could you --- when you  
05:25:06 9 move away from --- when you move back  
05:25:11 10 from your computer ---. Dr. Caughey,  
05:25:11 11 can you hear me now?  
05:25:12 12 A. Yes, I can. I'm sorry.  
05:25:13 13 Q. Okay.  
05:25:14 14 Please try to stay close to  
05:25:15 15 your computer.  
05:25:17 16 A. Yes.  
05:25:18 17 Q. So Dr. Caughey, I was asking  
05:25:21 18 you how the selection of previous  
05:25:23 19 election data affects the outcome and  
05:25:26 20 what Plan Score does to control for  
05:25:29 21 that factor?  
05:25:32 22 A. So Plan Score estimates what  
05:25:37 23 the relationship between Presidential  
05:25:39 24 vote and Congressional vote is, both  
05:25:39 25 nationally, but also taking into

05:25:39 1 account specific factors. And as we  
05:25:39 2 saw Plan Score's estimates, it  
05:25:51 3 estimates 51 percent. It's very ---  
05:25:54 4 it's a very accurate --- it's very  
05:25:56 5 close to the actual percentage earned  
05:25:59 6 on average by Republicans over the  
05:26:01 7 last ten years, as well as in the last  
05:26:03 8 election.

05:26:04 9 So that's it projection as its  
05:26:08 10 best guess going forward. But it also  
05:26:10 11 takes into account the likely  
05:26:13 12 variability around that, right, that  
05:26:14 13 in some years Democrats will do better  
05:26:17 14 on average and in some years  
05:26:18 15 Republicans will do better on average.

05:26:22 16 And so it's taking into account  
05:26:23 17 that variation, but I think the one  
05:26:27 18 fundamental flaw in Barber's analysis  
05:26:35 19 is that he's pegging the --- he's  
05:26:35 20 predicting the Democratic vote share  
05:26:40 21 to be around 54 percent, which is  
05:26:42 22 higher than it has been in almost  
05:26:44 23 every election over the last decade.  
05:26:47 24 So it's not a realistic prediction.

05:26:47 25 But he also --- even if it

05:26:47 1 were realistic to say it was 54  
05:26:54 2 percent, winning only eight seats or  
05:26:57 3 between 8 and 9 seats would not be the  
05:27:00 4 normal winner's bonus that we would  
05:27:04 5 expect. Right? We saw that  
05:27:05 6 Republicans would be expected to win  
05:27:07 7 58 percent of seats with 51 percent of  
05:27:07 8 the vote. So with 54 percent of the  
05:27:10 9 --- you know. So you can see there's  
05:27:12 10 a bit of a kind of the eight ball  
05:27:16 11 there, I think, in that report.  
05:27:17 12 Q. Thank you, Dr. Caughey. And  
05:27:17 13 I'm going to wrap up right here for  
05:27:20 14 you.

05:27:21 15 All the conclusions you gave  
05:27:22 16 today about partisan fairness, have  
05:27:25 17 you given those to a reasonable degree  
05:27:27 18 of professional certainty in your  
05:27:29 19 field?

05:27:32 20 A. Can you say that again?

05:27:33 21 Q. Have you given your conclusions  
05:27:36 22 to within a reasonable degree of  
05:27:37 23 professional certainty?

05:27:38 24 A. Yes.

05:27:40 25 ATTORNEY ATTISANO:

05:27:41 1 Thank you.

05:27:41 2 JUDGE McCULLOUGH:

05:27:41 3 Okay. Thank you. Now,

05:27:45 4 we're going to start with Cross

05:27:48 5 Examination.

05:27:50 6 We'll begin with

05:27:53 7 attorney --- or you're not Attorney

05:27:53 8 Carter. The attorney for Petitioner

05:27:56 9 Carter.

05:27:56 10 ATTORNEY POSIMATO:

05:27:57 11 Good afternoon, Your

05:27:57 12 Honor.

05:27:57 13 JUDGE MCCULLOUGH:

05:27:57 14 Good afternoon.

05:27:59 15 ATTORNEY POSIMATO:

16 Joe Posimato on behalf

17 of the Carter Petitioners.

18 ---

19 CROSS EXAMINATION

20 ---

05:28:04 21 BY ATTORNEY POSIMATO:

05:28:04 22 Q. Good afternoon, Dr. Caughey.

05:28:04 23 A. Hi.

05:28:04 24 Q. My name is Joe Posimato. I'm

05:28:04 25 Counsel on behalf of the Carter

05:28:09 1 Petitioners. I just have a few  
05:28:09 2 questions for you. That said, I want  
05:28:10 3 to say I'm sorry about the health  
05:28:11 4 crisis you're dealing with, and I  
05:28:13 5 thank you for being here.

05:28:14 6 You produced two reports in  
05:28:16 7 this case?

05:28:16 8 Correct?

05:28:19 9 A. I produced two reports, meaning  
05:28:28 10 two different --- I actually don't how  
05:28:30 11 --- I don't actually know the answer  
05:28:31 12 to that, because ---. Do you mean for  
05:28:33 13 --- I produced a report on the State  
05:28:33 14 Senate in a separate and then also on  
05:28:40 15 the State House. Is that what you're  
05:28:41 16 referring to?

05:28:41 17 Q. No. I'm just referring to the  
05:28:42 18 fact that you filed the report on the  
05:28:44 19 24th that was provided on Monday of  
05:28:47 20 this week and then there was another  
05:28:48 21 one filed on the 26th.

05:28:48 22 Correct?

05:28:50 23 A. Yes, I'm sorry. I believe ---  
05:28:54 24 I believe you're right, but I actually  
05:28:58 25 don't honestly remember.

05:28:58 1 Q. Sure. And in those reports you  
05:28:59 2 only analyzed a few of the plan  
05:29:01 3 proposals that are before the Court  
05:29:03 4 today?

05:29:06 5 A. I think so. To be honest, I  
05:29:09 6 don't even --- I'm not even sure the  
05:29:13 7 universe of plans that have been  
05:29:13 8 submitted, but that's correct.

05:29:15 9 Q. And you didn't analyze the  
05:29:19 10 Carter Petitioner's proposal produced  
05:29:20 11 by Dr. Rodden?

05:29:22 12 A. I don't think so. At least I  
05:29:26 13 don't know it by that name, Carter,  
05:29:32 14 sorry.

05:29:33 15 Q. And you didn't analyze a report  
05:29:35 16 produced by Dr. Rodden? You don't  
05:29:39 17 recall doing that?

05:29:39 18 A. No, I did not.

05:29:40 19 Q. How did you decide which  
05:29:42 20 proposals to include in your analysis?

05:29:46 21 A. I was given --- I was provided  
05:29:51 22 with saved files and I did the  
05:29:57 23 analysis of all the ones that I was  
05:30:01 24 provided. Let me --- let me just take  
05:30:07 25 a moment to think about --- let me



05:30:11 1 just check on one that I --- make sure  
05:30:15 2 I'm correct on that, if you don't  
05:30:18 3 mind. I know you're under the clock.  
05:30:20 4 Q. Yeah. If it won't take you  
05:30:22 5 that long, I'll give you the time.  
05:30:24 6 A. Okay. Thank you.  
05:30:34 7 I did --- I did one --- no,  
05:30:37 8 sorry, I did one more analysis very  
05:30:40 9 quickly. I didn't have time --- I  
05:30:44 10 received many, many drafts and it  
05:30:46 11 takes a while to like work them up.  
05:30:47 12 So there is one that I didn't include  
05:30:49 13 in the report, is as I understand it,  
05:30:51 14 which is submitted by someone named  
05:30:53 15 Ollie. And I did --- I think I  
05:30:59 16 submitted its Plan Score to briefly  
05:31:01 17 look at but didn't incorporate it into  
05:31:06 18 the report at the time.  
05:31:07 19 Q. You claim in your reports that  
05:31:11 20 among the plans you did analyze, the  
05:31:12 21 Senate Democratic --- the two  
05:31:14 22 proposals of the Democrats were most  
05:31:20 23 fair?  
05:31:20 24 A. That's right. Of the ones that  
05:31:25 25 I analyzed those were the most fair,

05:31:26 1 correct.

05:31:26 2 Q. Dr. Caughey, you have your

05:31:28 3 second report before you ---

05:31:30 4 A. Correct.

05:31:31 5 Q. --- that was filed on the 26th?

05:31:32 6 Yeah. Can you please turn to page 21

05:31:34 7 of that report?

05:31:38 8 A. Yes.

05:31:38 9 Q. And on this page in Table 5 you

05:31:40 10 analyze the partisan fairness of

05:31:42 11 Senate Democratic Plan 2.

05:31:45 12 Correct?

05:31:46 13 A. Correct.

05:31:46 14 Q. And you conclude in this table

05:31:50 15 that the Senate Democratic Plan 2 has

05:31:52 16 a .5 percent mean-median deviation.

05:32:02 17 Correct?

05:32:02 18 A. That's right.

05:32:03 19 Q. And further down the page in

05:32:05 20 the last paragraph, in fact, you

05:32:06 21 describe this plan, the Senate

05:32:08 22 Democratic Plan 2, as being unusually

05:32:10 23 fair.

05:32:11 24 Correct?

05:32:14 25 A. That's --- well, I assume ---

05:32:19 1 yes, taking into account all the  
05:32:22 2 metrics.  
05:32:23 3 Q. Sure. And could you see the  
05:32:30 4 exhibit we have displayed?  
05:32:33 5 A. I'm sorry. I lost you for a  
05:32:36 6 second there. Can you repeat that?  
05:32:37 7 Q. I asked whether you could see  
05:32:38 8 the exhibit we're displaying on our  
05:32:38 9 side.  
05:32:42 10 A. Repeat that one more time. I  
05:32:44 11 could hear the second half. Go ahead.  
05:32:46 12 Q. I asked whether you could see  
05:32:47 13 the exhibit we're displaying on our  
05:32:49 14 side.  
05:32:50 15 A. I can.  
05:32:50 16 Q. Okay.  
05:32:53 17 Dr. Caughey, I'd like to now  
05:32:58 18 show you part of Dr. Rodden's report  
05:32:59 19 in this case, in fact, a table from  
05:33:01 20 his second report, Table 6 on page 11.  
05:33:05 21 We're going to blow it up for you.  
05:33:09 22 A. Sure.  
05:33:09 23 Q. And in Table 6 you see here  
05:33:10 24 that Dr. Rodden calculated the  
05:33:15 25 mean-median deviation of the proposed

05:33:16 1 plans ---

05:33:17 2 A. Yup.

05:33:18 3 Q. --- in this case. And in this  
05:33:18 4 table Dr. Rodden presented the scores  
05:33:22 5 in decimals.

05:33:25 6 Correct?

05:33:26 7 A. I assume that's what that  
05:33:27 8 means, yes.

05:33:28 9 Q. And forgive my rudimentary math  
05:33:32 10 here, but you --- it's possible to  
05:33:34 11 convert decimals into percentages by  
05:33:34 12 just multiplying by a hundred, right,  
05:33:35 13 moving the decimal place ---

05:33:36 14 A. Yes.

05:33:37 15 Q. --- a couple of zeros? Okay.

05:33:42 16 And when you do that  
05:33:44 17 conversion, you can see that the  
05:33:46 18 Carter plan here analyzed is --- has a  
05:33:48 19 .5 percent mean-median deviation?

05:33:56 20 A. I do see that.

05:33:57 21 Q. And that number is equal to the  
05:33:59 22 mean-median deviation of the Senate  
05:34:03 23 Democrat Plan 2 which you had called  
05:34:04 24 unusually fair?

05:34:05 25 A. The only thing I would --- the

05:34:08 1 number is equal, but its meaning might  
05:34:12 2 be slightly different because I assume  
05:34:13 3 that --- I'm not sure, because the  
05:34:18 4 main-median depends on what exactly  
05:34:22 5 the results you're using are, what the  
05:34:22 6 two results you're using are. And  
05:34:26 7 that is --- you know, it's probably  
05:34:27 8 based on slightly different data, but  
05:34:29 9 that's still a very small difference,  
05:34:33 10 yes. It absolutely is.

05:34:33 11 Q. Right. A perfect mean-median  
05:34:35 12 deviation score would be zero.

05:34:36 13 Correct?

05:34:37 14 A. Correct.

05:34:37 15 Q. And a .5 percent deviation is  
05:34:39 16 very close to zero?

05:34:40 17 A. Correct.

05:34:41 18 Q. And that's --- that very close  
05:34:43 19 to zero score is the same score that  
05:34:52 20 the Senate Democratic Plan 2 has in  
05:34:52 21 your report?

05:34:53 22 A. Yes, the score is the same ---  
05:34:53 23 the data might be different but I'm  
05:34:55 24 sure they're very similar.

05:34:56 25 Q. Sure.

05:34:56

1

ATTORNEY POSIMATO:

05:34:57

2

Okay. Thank you, Dr.

05:34:59

3

Caughey. No further questions.

05:35:00

4

JUDGE McCULLOUGH:

05:35:01

5

Okay. Thank you.

05:35:03

6

Counsel. All right. Attorneys for

05:35:04

7

Petitioner Gressman.

05:35:04

8

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05:35:04

9

CROSS EXAMINATION

05:35:25

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BY ATTORNEY HARRISON:

05:35:25

12

Q. Hi, Dr. Caughey. My name is

05:35:26

13

Lindsay Harrison, and I represent the

05:35:27

14

Gressman Math Science Petitioners in

05:35:28

15

the case. And I also just wanted to

05:35:29

16

say I hope everyone in your family is

05:35:33

17

doing okay and that you guys get

05:35:34

18

through this. Thank you for being

05:35:35

19

here.

05:35:36

20

A. Thank you.

05:35:37

21

Q. Plan Score is a website that

05:35:41

22

existed before this litigation was

05:35:42

23

filed six weeks ago.

05:35:43

24

Correct?

05:35:45

25

A. Correct.

05:35:46

1

Q. Okay.

05:35:47

2

05:35:49

3

05:35:51

4

05:35:52

5

And as far as you know, it was not created by any of the experts who are testifying here in this litigation.

05:35:53

6

Correct?

05:35:56

7

05:35:57

8

05:36:00

9

A. I don't actually know who all the experts are, but as far as I know, that is correct.

05:36:00

10

Q. Okay.

05:36:01

11

05:36:06

12

It was not created by Dr. DeFord, Gerald DeFord?

05:36:08

13

A. No.

05:36:08

14

Q. Okay.

05:36:09

15

05:36:11

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05:36:13

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05:36:16

18

And as far as you know, it wasn't created by any of the parties participating in this litigation either?

05:36:16

19

Correct?

05:36:17

20

A. Correct.

05:36:17

21

05:36:19

22

05:36:22

23

05:36:24

24

Q. And I think you said it's available to any member of the public who might want to check a map's partisan fairness.

05:36:25

25

Is that right?

05:36:26 1 A. Yes.

05:36:27 2 Q. All they need is the shape  
05:36:29 3 file, they would upload it and then  
05:36:31 4 they would be able to see what Plan  
05:36:33 5 Score estimates its partisan fairness  
05:36:36 6 to be.

05:36:36 7 Correct?

05:36:37 8 A. That's correct.

05:36:38 9 Q. Okay.

05:36:42 10 And I think we've established  
05:36:44 11 you didn't review all of the reports  
05:36:46 12 --- all the maps that are submitted in  
05:36:48 13 the record in this case.

05:36:49 14 Is that right?

05:36:50 15 A. I didn't evaluate them ---  
05:36:52 16 that's right. I didn't do the  
05:36:54 17 evaluation that I described. Yes, I  
05:36:57 18 didn't do a formal evaluation of all  
05:36:59 19 of them.

05:37:02 20 Q. Okay.

05:37:02 21 And were you aware that there  
05:37:04 22 was a map submitted by a group of  
05:37:05 23 Pennsylvania math and science  
05:37:08 24 professors in the case?

05:37:09 25 A. I was --- I was --- I did learn



05:37:12 1 about that at some point in the last  
05:37:14 2 few days, and I read the brief that  
05:37:16 3 accompanied that.

05:37:17 4 Q. Okay.

05:37:19 5 Did you ever run that map  
05:37:20 6 through Plan Score, even if it didn't  
05:37:22 7 appear in your reports?

05:37:24 8 A. I did not. At least I don't  
05:37:29 9 believe I did. The --- I don't think  
05:37:33 10 I ever received the shape files for  
05:37:36 11 it.

05:37:36 12 Q. Okay.

05:37:36 13 Did you ever review the expert  
05:37:40 14 report of Dr. DeFord, who is the  
05:37:42 15 expert for the Gressman Math and  
05:37:46 16 Scientist Petitioners? He prepared  
05:37:48 17 two expert reports in the case.

05:37:48 18 A. I had read the an expert report  
05:37:54 19 that discussed that map, which I  
05:37:55 20 assume it could have been him, but I  
05:37:57 21 actually am not a 100 percent  
05:37:59 22 positive.

05:37:59 23 Q. Okay.

05:38:02 24 A. But I can look that up if it's  
05:38:04 25 important.

05:38:04 1 Q. No, that's okay.

05:38:08 2 I --- let me just represent to  
05:38:10 3 you that Dr. DeFord testified and put  
05:38:12 4 in his report that he ran all the maps  
05:38:14 5 that were submitted to the Court  
05:38:16 6 through Plan Score and then attached  
05:38:19 7 the results as Appendix D to his  
05:38:28 8 expert report.

05:38:28 9 A. Okay.

05:38:28 10 Q. And so what I would like to do  
05:38:30 11 now is --- we'll see if I'm able to  
05:38:32 12 use it, show you the first part of  
05:38:34 13 Appendix D to his expert report, which  
05:38:37 14 is the Gressman Math and Science  
05:38:40 15 Petitioners Plan Score report.

05:38:43 16 A. Okay.

05:38:51 17 Q. Okay.

05:38:53 18 Does this look to you like a  
05:38:56 19 Plan Score report that you would  
05:38:57 20 receive when using the website?

05:39:00 21 A. Yes, it does.

05:39:01 22 Q. Okay.

05:39:05 23 And just for completeness,  
05:39:06 24 there is a second page of it. That  
05:39:09 25 also looks to you ---

05:39:10 1 A. Yes

05:39:11 2 Q. --- like the Plan Score reports  
05:39:16 3 that you reviewed as well.

05:39:18 4 A. Yes.

05:39:19 5 Q. Okay.

05:39:22 6 So now what I want to do is go  
05:39:23 7 to page 22 of your rebuttal report,  
05:39:34 8 and this is your comparison of maps.

05:39:36 9 Do you see at that?

05:39:38 10 A. Yes.

05:39:38 11 Q. Okay.

05:39:40 12 And what I would like to do is  
05:39:42 13 walk through with you if you had  
05:39:44 14 evaluated the Gressman Math and  
05:39:50 15 Science Map, how it would compare to  
05:39:51 16 the other maps that you compared on  
05:39:54 17 this chart. So I've written GMS next  
05:40:02 18 to where you have current map,  
05:40:04 19 Governor, Republican, Democratic 1 and  
05:40:08 20 Democratic 2.

05:40:09 21 Okay?

05:40:10 22 A. Yup. Uh-huh (yes).

05:40:11 23 Q. So if you had run the Gressman  
05:40:17 24 Math Science map through Plan Score  
05:40:20 25 and gotten the report that Dr. DeFord

05:40:24 1 got, the partisan bias score for the  
05:40:36 2 GSM map would be .9 percent. That's  
05:40:47 3 correct, right?  
05:40:48 4 A. That's what it looks like, yes.  
05:40:49 5 Q. And that's lower than all of  
05:40:50 6 the maps that you reported on.  
05:40:51 7 Correct?  
05:40:51 8 A. Correct.  
05:40:52 9 Q. And that means that the  
05:40:55 10 partisan bias of the Gressman Math and  
05:40:55 11 Science Map is less than the partisan  
05:40:55 12 bias of all of those other maps.  
05:40:58 13 Correct?  
05:40:58 14 A. Correct.  
05:40:59 15 Q. Okay.  
05:41:16 16 And the efficiency gap of the  
05:41:17 17 Gressman Math and Science Map in Plan  
05:41:20 18 Score is 1.4 percent.  
05:41:24 19 Correct? That's this number  
05:41:25 20 right here?  
05:41:26 21 A. Correct.  
05:41:29 22 Q. And that number is also less  
05:41:32 23 than all of the maps that you  
05:41:34 24 evaluated in Plan Score.  
05:41:37 25 Right?

05:41:37 1 A. That's right.

05:41:38 2 Q. And that means that as measured  
05:41:40 3 in terms of efficiency gap, the  
05:41:42 4 Gressman Math and Science Map is also  
05:41:46 5 less partisan biased, more fair and  
05:41:48 6 equal to all of the other voters than  
05:41:51 7 the other maps that you did evaluate.

05:41:52 8 Correct?

05:41:53 9 A. According to that metric, yes.

05:41:55 10 Q. And according to Plan Score,  
05:42:15 11 the mean-median difference for the  
05:42:20 12 Gressman Math and Science Map is .4  
05:42:28 13 percent R, which means that, as  
05:42:28 14 measured by that metric, the Gressman  
05:42:30 15 Math and Science Map is also less  
05:42:32 16 biased than all of the other maps that  
05:42:32 17 you evaluated.

05:42:35 18 Correct?

05:42:35 19 A. That's correct. And also I  
05:42:37 20 just want to say that I'm assuming  
05:42:44 21 that there are --- well, anyway, I  
05:42:45 22 don't know exactly what --- whoever  
05:42:46 23 uploaded these, like there is one  
05:42:49 24 switch you need to toggle and like you  
05:42:51 25 need to choose whether to base your

05:42:53 1 results on the 2020 --- or the 2020  
05:42:59 2 average --- 2012 to 2020 average. The  
05:43:01 3 default is 2020, which is what I used,  
05:43:01 4 so I assume they did the same thing  
05:43:03 5 here, so this is the apples to apples.  
05:43:06 6 Q. Okay.

05:43:06 7 And I will represent to you  
05:43:07 8 that Dr. DeFord actually attached all  
05:43:11 9 of the Plan Score reports to his  
05:43:13 10 report, not just this one, so that it  
05:43:16 11 can be seen as apples to apples.

05:43:19 12 So let's look at the last one,  
05:43:21 13 which is declination. And so  
05:43:30 14 declination of the Gressman Math  
05:43:36 15 Science Map is .03, which again is  
05:43:38 16 lower than all of the other maps you  
05:43:38 17 evaluated.

05:43:57 18 Correct?

05:43:57 19 A. Correct.

05:43:57 20 Q. Okay.

05:43:57 21 And so on each of the four  
05:44:02 22 metrics that Plan Score uses to  
05:44:02 23 evaluate partisan bias, you would  
05:44:04 24 agree that the Gressman Math Science  
05:44:07 25 Map achieves better less biased scores

05:44:08 1 than all of the maps you evaluated.

05:44:08 2 Correct?

05:44:10 3 A. That is correct. And can I  
05:44:12 4 just add one more thing, which is I  
05:44:13 5 realize that I did not actually review  
05:44:16 6 this report that I said I thought I  
05:44:18 7 had reviewed. That was a different  
05:44:20 8 report for the State Senate Plan.

05:44:21 9 Q. Thank you.

05:44:23 10 ATTORNEY HARRISON:

05:44:24 11 Thank you. I have  
05:44:24 12 nothing further.

05:44:26 13 JUDGE McCULLOUGH:

05:44:26 14 Thank you, Counsel. Now  
05:44:27 15 we'll hear from Governor Wolf and not  
05:44:38 16 Secretary Chapman. Okay. Attorney  
05:44:44 17 Wiygul.

05:44:46 18 ATTORNEY WIYGUL:

05:44:53 19 Thank you, Your Honor.

05:44:53 20 ---

05:44:53 21 CROSS EXAMINATION

05:44:53 22 --

05:44:53 23 BY ATTORNEY WIYGUL:

05:44:55 24 Q. Good afternoon, Professor -- is  
05:44:58 25 it Caughey.

05:45:00 1 A. Caughey (corrects  
05:45:00 2 pronunciation).  
05:45:00 3 Q. Okay.  
05:45:00 4 Sorry about that. And let me  
05:45:02 5 be the next to express my appreciation  
05:45:05 6 for you being here despite the  
05:45:07 7 circumstances. Thank you?  
05:45:08 8 I just want to confirm what I  
05:45:11 9 thought I heard you say during your  
05:45:13 10 Direct Examination, which was that ---  
05:45:15 11 and I represent Governor Wolf, that  
05:45:18 12 the Governor's plan performed very  
05:45:18 13 similarly on partisan fairness metrics  
05:45:24 14 to the current plan, the plan adopted  
05:45:26 15 by the Pennsylvania Supreme Court in  
05:45:28 16 2018.  
05:45:28 17 Is that correct?  
05:45:34 18 A. That's correct.  
05:45:34 19 Q. I'm sorry, it is correct?  
05:45:36 20 A. Yes, it is correct.  
05:45:36 21 Q. Thank you.  
05:45:37 22 I'd like to ask you a few  
05:45:39 23 questions about Plan Score, which has  
05:45:41 24 already come up a number of times  
05:45:42 25 today. Are you aware that Plan Score



05:45:45 1 is based on an election index that  
05:45:48 2 blends a collection of elections into  
05:45:51 3 an average and then adds random noise?  
05:45:59 4 A. So it's not --- it actually  
05:46:00 5 does depend on which --- there are two  
05:46:02 6 models that one can choose from. It  
05:46:07 7 is true that it uses data from  
05:46:10 8 multiple elections, at least one of  
05:46:15 9 its incarnations to provide the  
05:46:15 10 baseline. So in that sense, yes.  
05:46:21 11 Q. You agree it's a blended  
05:46:24 12 average of the election results?  
05:46:26 13 A. Well, I just wouldn't call it a  
05:46:29 14 blended average. I would say it uses  
05:46:34 15 information from multiple elections to  
05:46:36 16 make predictions.  
05:46:37 17 Q. It doesn't then look at those  
05:46:39 18 elections individually, right? It ---  
05:46:40 19 whether you want to call it a blended  
05:46:42 20 average, it aggregates that in some  
05:46:42 21 way.  
05:46:48 22 Correct?  
05:46:48 23 A. Yes. It averages them together  
05:46:50 24 and then it uses the information about  
05:46:52 25 the distribution that it learns. It

05:46:53 1 learns also about the spread and then  
05:46:59 2 uses that in its simulations to create  
05:47:01 3 that variation.

05:47:01 4 Q. Okay.

05:47:01 5 Do you know which elections  
05:47:01 6 were used in Plan Score for  
05:47:09 7 Pennsylvania?

05:47:09 8 A. They are the Presidential  
05:47:09 9 election results. Again, I can  
05:47:19 10 confirm, but the baseline is the 2020  
05:47:20 11 results.

05:47:20 12 Q. It's only the Presidential year  
05:47:26 13 election results?

05:47:26 14 A. So what it's doing, right, is  
05:47:28 15 it's using the Presidential election  
05:47:30 16 results plus incumbency to predict  
05:47:35 17 Congressional election results in all  
05:47:38 18 the years between 2012 and 2020. So  
05:47:40 19 it's using both the Congressional  
05:47:43 20 election results and the Presidential  
05:47:48 21 election results as sort of like a  
05:47:48 22 helper to make those predictions, if  
05:47:48 23 that makes sense. And then it's also  
05:47:48 24 of course using --- that's what ---  
05:47:51 25 that's how it projects it forward,

05:47:53 1 right, using the relationship it  
05:47:56 2 learns between the Presidential  
05:47:56 3 Election results and Congressional  
05:48:01 4 ones to project those forward, if that  
05:48:03 5 makes sense.

05:48:03 6 Q. I think I understand, but just  
05:48:05 7 so we're on the same page, in terms of  
05:48:05 8 the actual historical election results  
05:48:05 9 that Plan Score is using, it's the  
05:48:12 10 Presidential and Congressional results  
05:48:15 11 from 2012 to 2020?

05:48:17 12 A. Yes.

05:48:17 13 Q. So no other elections besides  
05:48:19 14 those.

05:48:21 15 Correct?

05:48:22 16 A. That's right. As far as I  
05:48:23 17 know, no --- yes, that's right.

05:48:25 18 Q. Would you agree that election  
05:48:27 19 data includes complicated statistical  
05:48:30 20 work that transforms precinct level  
05:48:34 21 results into common geographical  
05:48:36 22 units?

05:48:39 23 A. Involves? What do you mean by  
05:48:42 24 ---? In order to take --- you have to  
05:48:43 25 take --- if what you're saying is in

05:48:46 1 order to make these projections, you  
05:48:46 2 need to take precinct-level data and  
05:48:46 3 match them to the Congressional  
05:48:46 4 districts using the shape files, the  
05:48:55 5 answer is yes.

05:48:55 6 Q. Okay.

05:48:57 7 And is it fair to describe that  
05:49:00 8 as, you know, fairly complicated  
05:49:00 9 statistical work?

05:49:01 10 A. You know, I actually wouldn't  
05:49:03 11 call that statistics. I would call  
05:49:05 12 that more just, you know, data  
05:49:11 13 analysis or data management, but I  
05:49:11 14 mean, they're all pretty similar  
05:49:14 15 things, so yes.

05:49:14 16 Q. Did you have an opportunity to  
05:49:14 17 check and vet the election data that  
05:49:14 18 Plan Score relied on or do you have  
05:49:18 19 any idea of how it was collected and  
05:49:21 20 compiled?

05:49:22 21 A. I do. So it was collected on  
05:49:26 22 --- I don't have --- I don't have the  
05:49:31 23 dataset --- I'm sorry. What I mean to  
05:49:32 24 say is they --- the ultimate data is  
05:49:38 25 based on an open source website run by

05:49:42 1 the Voting and Election Science Team  
05:49:45 2 at the University of Florida, which is  
05:49:51 3 one of state universities. So that's  
05:49:51 4 the ultimate precinct-level data. And  
05:49:54 5 so I have looked at that  
05:49:56 6 precinct-level data, if that makes ---  
05:49:58 7 if that's what you mean?

05:50:00 8 Q. Did you vet that data? Did you  
05:50:06 9 see that data?

05:50:07 10 A. No. I mean, did I go through  
05:50:08 11 and make sure that that data was  
05:50:08 12 correct in every instance, like every  
05:50:08 13 piece ---?

05:50:08 14 Q. Right.

05:50:13 15 A. I did not,

05:50:13 16 Q. Correct.

05:50:14 17 A. I relied on --- I relied on  
05:50:16 18 that team to have done that.

05:50:16 19 ATTORNEY WIYGUL:

05:50:18 20 Can we pull up Table 7  
05:50:40 21 of the Professor's report? And I  
05:50:40 22 apologize I think I just surprised my  
05:50:40 23 assistant with a request so if you  
05:50:40 24 could bear with us?

05:50:40 25 BY ATTORNEY WIYGUL:

05:50:47 1 Q. Can you see that or do you  
05:50:49 2 otherwise have access to your report?

05:50:53 3 A. I do.

05:51:09 4 Q. I'm not sure that's it. But in  
05:51:12 5 Table 7 you report --- across four  
05:51:14 6 kinds of partisan scores.

05:51:15 7 Correct?

05:51:17 8 A. Did you say Table 7?

05:51:18 9 Q. Yes.

05:51:19 10 A. Yes, I did.

05:51:20 11 Q. Okay.

05:51:21 12 And are you testifying that in  
05:51:23 13 your expert opinion it's good practice  
05:51:24 14 to take an average of metrics that are  
05:51:27 15 in different units?

05:51:30 16 A. So these are all in the same  
05:51:31 17 units. They're all in percentiles of  
05:51:36 18 severity relative to the distribution.  
05:51:39 19 So in that sense I think it is  
05:51:41 20 reasonable to take an average as a  
05:51:44 21 summary of --- as a summary across  
05:51:49 22 these different metrics. It's as if  
05:51:56 23 you are weighting --- you took them  
05:51:56 24 equally. So yeah, I actually think  
05:51:59 25 that it is reasonable in this case.

05:51:59 1 Q. Would you agree with me that  
05:52:00 2 partisan bias is measured in seat  
05:52:03 3 share units?

05:52:04 4 A. Partisan bias is measured in  
05:52:06 5 seat share units, but this is not the  
05:52:09 6 average of the partisan bias. This is  
05:52:09 7 average of the extremity relative ---  
05:52:09 8 this is the average of the ---  
05:52:14 9 basically where it falls in the  
05:52:15 10 distribution. So it is true that  
05:52:19 11 partisan bias is measured as seat  
05:52:21 12 shares, yeah.

05:52:22 13 Q. So just so I understand, you're  
05:52:23 14 taking different unit measurements,  
05:52:25 15 you're converting them into a  
05:52:27 16 distribution share and then averaging  
05:52:31 17 that?

05:52:31 18 A. That's right. So it would be  
05:52:34 19 like --- you know, it would be like  
05:52:39 20 taking --- you know, you have two  
05:52:40 21 tests where, you know, there are  
05:52:42 22 different numbers of questions and  
05:52:45 23 different content and you got 91  
05:52:47 24 percent on one and a 95 percent on the  
05:52:47 25 other. You average those together to

05:52:49 1 be 92.5.

05:52:50 2 Q. All right.

05:52:51 3 You're aware that other experts  
05:52:52 4 have collected and compiled and vetted  
05:52:55 5 election data and have computed  
05:52:57 6 essentially the same scores,  
05:53:00 7 efficiency gap, mean-medium ---  
05:53:00 8 mean-median and partisan bias on each  
05:53:04 9 election individually before reporting  
05:53:06 10 on aggregate performance?

05:53:11 11 A. Am I aware that they have done  
05:53:13 12 that?

05:53:13 13 Q. Correct.

05:53:19 14 A. I assume --- I guess --- I  
05:53:19 15 guess I am.

05:53:20 16 Q. Well, I just want to know do  
05:53:24 17 you know that that is, in fact, what  
05:53:26 18 happened and happened with at least  
05:53:27 19 one or two of the experts in this  
05:53:29 20 case?

05:53:34 21 A. I would believe you if you told  
05:53:36 22 me that. Let's put it that way.

05:53:37 23 Q. Fair enough. Fair enough.

05:53:39 24 Very good answer.

05:53:39 25 Are you testifying that in your



05:53:41 1 professional opinion a push-button  
05:53:43 2 website with the data sourcing that  
05:53:46 3 you haven't vetted at least in its  
05:53:48 4 entirety should be considered more  
05:53:51 5 reliable than having leading experts  
05:53:56 6 using vetted election data to report  
05:54:06 7 on the partisan metrics in more detail  
05:54:07 8 one election at a time?

05:54:07 9 A. No, I'm not saying that. But  
05:54:08 10 what I'm saying is that --- first of  
05:54:08 11 all, I would say that the experts that  
05:54:11 12 --- the reports that I've seen and the  
05:54:12 13 testimony that I saw from other  
05:54:14 14 experts, especially from who I believe  
05:54:19 15 the expert for you is, Moon Duchin,  
16 was excellent, and I have no reason to  
17 doubt anything that she said.

18 And I would say that she did a  
19 different set of analyses than I did.  
20 I wouldn't quite call this a  
21 push-button website because in order  
05:54:42 22 to --- one of the virtues of Plan  
05:54:42 23 Scores is it's meant to democratize  
05:54:42 24 these types of techniques and not keep  
05:54:49 25 them just so that experts or map

05:54:50 1 drawers can use them, and do so in a  
05:54:53 2 way that academically rigorous. So I  
05:54:53 3 would say that that's a virtue of Plan  
05:54:53 4 Score.

05:54:59 5 And I don't think there's  
05:55:00 6 anything wrong with taking advantage  
05:55:02 7 of that process. In the same way that  
05:55:04 8 there's no problem with using  
05:55:04 9 open-source software that has been  
05:55:06 10 produced by other people to do one's  
05:55:08 11 own work. That all being said I ---  
05:55:11 12 I'll just say one more thing, which is  
05:55:13 13 it is always better to vet one's data,  
05:55:18 14 but there's --- its is impossible to  
05:55:20 15 know --- you have to at some point in  
05:55:21 16 academia always trust someone else  
05:55:23 17 that they have done their job  
05:55:25 18 correctly. And in this case I'm  
05:55:26 19 choosing --- with regard to the data,  
05:55:28 20 I'm choosing to trust the academics in  
05:55:28 21 charge of the Voting Science Team and  
05:55:28 22 also those that put together Plan  
05:55:28 23 Score's algorithm and so forth did a  
05:55:41 24 good job. But if you could show me  
05:55:42 25 otherwise, that would be, you know,

05:55:44 1 important to know.

05:55:45 2 ATTORNEY WIYGUL:

05:55:45 3 Thank you very much for  
05:55:47 4 your time and for your responsive and  
05:56:05 5 thoughtful answers, Doctor.

05:56:05 6 JUDGE McCULLOUGH;

05:56:05 7 Thank you, Counsel.

05:56:06 8 Now we will move to  
05:56:07 9 attorneys for the House Republican  
05:56:07 10 Legislature.

05:56:07 11 ---

05:56:07 12 CROSS EXAMINATION

05:56:07 13 ---

05:56:17 14 BY ATTORNEY TUCKER:

05:56:17 15 Q. Good afternoon, Dr. Caughey.

05:56:21 16 A. Hello.

05:56:21 17 Q. My name is Rob Tucker. I'm  
05:56:21 18 Counsel for the House Republican  
05:56:23 19 Intervenors, and thank you for your  
05:56:24 20 time this afternoon.

05:56:27 21 Just to clarify, so you didn't  
05:56:29 22 personally calculate the partisan  
05:56:31 23 fairness scores in your report.

05:56:38 24 Correct?

05:56:38 25 A. No, I relied on the scores

05:56:38 1 produced by the Plan Score website,  
05:56:40 2 correct.

05:56:40 3 Q. You loaded shape files in the  
05:56:43 4 Plan Score website and it gave you the  
05:56:45 5 scores?

05:56:45 6 A. That's right. So I --- that's  
05:56:51 7 correct.

05:56:51 8 Q. And I think you talked about  
05:56:52 9 just earlier with Counsel for the  
05:56:54 10 Governor that in Plan Score you can  
05:56:57 11 score the maps using an index of  
05:56:59 12 elections.

05:57:00 13 Is that right?

05:57:02 14 A. No, I would not call them --- I  
05:57:04 15 would not say an index. What it does  
05:57:10 16 is it uses information on Presidential  
05:57:13 17 vote, primarily, to project or to  
05:57:18 18 predict what Congressional election  
05:57:21 19 votes are likely to be like on average  
05:57:23 20 and also how much they are likely to  
05:57:26 21 vary across elections. So I would not  
05:57:29 22 refer to that as an index, but rather  
05:57:31 23 as a set of simulations or predictions  
05:57:34 24 based on a model of Congressional  
05:57:37 25 election results.

05:57:37 1 Q. But it looks at multiple  
05:57:39 2 elections and multiple years.  
05:57:41 3 Correct?  
05:57:42 4 A. Correct.  
05:57:42 5 Q. And I'm assuming Plan Score  
05:57:44 6 wouldn't do that if it didn't believe  
05:57:46 7 that to be a reliable methodology.

05:57:48 8 Right?

05:57:50 9 A. Yes. I think it does so  
05:57:52 10 because it believes that it's  
05:57:53 11 important to take into account swings,  
05:57:57 12 in particular differences across  
05:58:00 13 states, differences across election  
05:58:02 14 years.

05:58:02 15 Q. But as I understand it, the  
05:58:04 16 scores that you calculated were only  
05:58:06 17 based on 2020 elections, not multiple  
05:58:09 18 years of elections.

05:58:11 19 Is that right?

05:58:11 20 A. No, that's not quite right. So  
05:58:15 21 there --- the Plan Score --- as the  
05:58:20 22 2020 election have come online, they  
05:58:24 23 have the created a new option which is  
05:58:27 24 to use the 2020 results as a sort of  
05:58:30 25 expected baseline and the baseline for

05:58:37 1 the model, and then add in the yearly  
05:58:42 2 --- the sort of year-specific swings  
05:58:45 3 that it has estimated over the  
05:58:47 4 previous decade. So if it has  
05:58:49 5 estimated that in a typical year the  
05:58:54 6 standard deviation, say, of Republican  
05:58:58 7 vote share across years is three,  
05:59:01 8 which I think is its estimate, it adds  
05:59:04 9 in --- in its simulations it adds in  
05:59:09 10 variations ---.

05:59:09 11 Q. I apologize, Doctor, but we're  
05:59:10 12 on a tight --- let me try to cut to  
05:59:12 13 the chase here.

05:59:13 14 A. Sorry.

05:59:13 15 Q. So in the elections you used,  
05:59:15 16 does it include elections from  
05:59:18 17 multiple years of elections or just  
05:59:19 18 one year of elections?

05:59:20 19 A. It's based on the Congressional  
05:59:23 20 elections from 2012 and 2020, but the  
05:59:26 21 baseline estimate projecting forward  
05:59:27 22 is based on --- you use 2020 as the  
05:59:34 23 baseline and then used the historical  
05:59:34 24 variability in its projections going  
05:59:34 25 forward. It takes into account

05:59:38 1 historical variability.

05:59:38 2 Q. You agree that the mere fact  
05:59:40 3 that an apportionment scheme makes it  
05:59:43 4 more difficult for a particular group  
05:59:47 5 in a particular district to elect  
05:59:48 6 Representatives of its choice does not  
05:59:48 7 render that scheme unconstitutional.

05:59:48 8 Correct?

05:59:55 9 A. I have no --- I have no formal  
05:59:56 10 legal training, so I actually don't  
05:59:57 11 --- especially not in the Constitution  
05:59:59 12 of Pennsylvania, so I don't think I  
06:00:00 13 have a basis to answer that.

06:00:04 14 Q. Well, that was listed --- that  
06:00:04 15 was written in your article that you  
06:00:04 16 co-authored, correct, Relying upon the  
06:00:11 17 Bandemer Case?

06:00:11 18 A. Let me pull that up.

06:00:12 19 Q. Well, unfortunately, we're on  
06:00:14 20 the time clock here. We don't have  
06:00:16 21 the time for you to pull it up.

06:00:18 22 ATTORNEY ATTISANO:

06:00:19 23 Your Honor.

06:00:19 24 JUDGE McCULLOUGH:

06:00:19 25 Yes, Counsel.

06:00:19

1

ATTORNEY ATTISANO:

06:00:19

2

I object. I believe if

06:00:19

3

he's going to impeach the witness, an

06:00:22

4

expert with an article, he has to show

06:00:23

5

him the article so he can have an

06:00:24

6

opportunity to rebut it and understand

06:00:27

7

exactly what he's attempting to

06:00:29

8

impeach him with.

06:00:30

9

JUDGE McCULLOUGH:

06:00:31

10

Do you have the article?

06:00:33

11

ATTORNEY TUCKER:

06:00:33

12

I don't have it up, and

06:00:33

13

I'm willing to move on, Your Honor, I

06:00:33

14

was just asking him if recalls writing

06:00:33

15

that in his article. If he doesn't, I

06:00:36

16

will move on.

06:00:36

17

JUDGE McCULLOUGH:

06:00:36

18

The clock is stopped for

06:00:38

19

one minute if you want to find the

06:00:38

20

article.

06:00:38

21

ATTORNEY TUCKER:

06:00:39

22

That's okay, Your Honor.

06:00:40

23

I'll move on.

06:00:41

24

JUDGE McCULLOUGH:

06:00:42

25

All right. Thank you.



06:00:42

1

THE WITNESS:

06:00:45

2

It won't take me very

06:00:47

3

long to find it if that's important.

06:00:51

4

JUDGE McCULLOUGH:

06:00:51

5

Mr. Tucker, the witness

06:00:52

6

--- can you stop the clock for a

06:00:54

7

second? The witness offered to find

06:00:56

8

the article if you want.

06:00:57

9

ATTORNEY TUCKER:

06:00:57

10

If I'm not going to use

06:01:00

11

up my time while he finds the article,

06:01:01

12

then that would be fine. I just don't

06:01:02

13

want to waste my time looking for the

06:01:02

14

article.

06:01:02

15

JUDGE McCULLOUGH:

06:01:02

16

If you want to ask the

06:01:06

17

question ---.

06:01:06

18

THE WITNESS:

06:01:06

19

Would you like to tell

06:01:08

20

me the quotation you are referring to?

06:01:10

21

JUDGE McCULLOUGH:

06:01:10

22

You can start the clock

06:01:11

23

again. Excuse me.

06:01:11

24

BY ATTORNEY TUCKER:

06:01:12

25

Q. And I believe it's on the

06:01:12 1 opening --- the paragraph of the  
06:01:15 2 article that --- the mere fact that an  
06:01:16 3 apportionment makes it more difficult  
06:01:19 4 for a particular group in a particular  
06:01:19 5 district to elect Representatives of  
06:01:21 6 its choice does not render that scheme  
06:01:23 7 unconstitutional.

06:01:27 8 A. So yeah, that's an epigraph  
06:01:32 9 quoting Davis v. Bandemer. So that's  
06:01:33 10 not me saying that. That's me quoting  
06:01:38 11 relevant Supreme Court cases. I would  
06:01:38 12 say that's 1986 also. I don't know if  
06:01:42 13 that's ---.

06:01:42 14 Q. Thank you, Doctor.

06:01:43 15 I think we got the answer. I  
06:01:44 16 appreciate that.

06:01:47 17 How do you define a fair map?

06:01:49 18 A. Yeah, that's a good question.  
06:01:51 19 I would say that, you know, in my  
06:01:53 20 analysis I focus specifically on what  
06:01:56 21 I consider --- what I call partisan  
06:01:58 22 fairness. And I think that partisan  
06:01:59 23 fairness is only one aspect perhaps of  
06:02:04 24 a broader set of fairness  
06:02:05 25 considerations. But I take the

06:02:06 1 fundamental idea of partisan fairness  
06:02:09 2 is that the representation a party  
06:02:12 3 receives in the legislature does not  
06:02:21 4 --- given the amount --- number of  
06:02:29 5 votes they get shouldn't depend on  
06:02:30 6 the identity of the party in question.

06:02:30 7 Q. Thank you.

06:02:30 8 And various ways to measure  
06:02:33 9 that are the metrics you used in your  
06:02:34 10 report?

06:02:34 11 Correct?

06:02:35 12 A. Correct.

06:02:35 13 Q. Okay.

06:02:35 14 I want to quickly look at  
06:02:47 15 page 15 in your report.

06:02:48 16 A. Yeah.

06:02:49 17 Q. And specifically looking at the  
06:02:51 18 metrics that you calculated for  
06:02:54 19 HB-2146. And that's what's reflected  
06:03:02 20 here in Table 3.

06:03:05 21 Correct?

06:03:05 22 A. Let me just make sure. Yes,  
06:03:05 23 that's right, the proposed Republican  
06:03:05 24 House Map. That's what I call it,  
06:03:08 25 yes.

06:03:08 1 Q. And based upon these metrics,  
06:03:10 2 do you consider HB-2146 to be a fair  
06:03:13 3 plan based upon these partisan  
06:03:15 4 fairness metrics?

06:03:19 5 A. So it's certainly not --- I  
06:03:21 6 mean fairness is a matter of degree.  
06:03:24 7 Any deviation from zero is somewhat  
06:03:27 8 unfair. I would say that --- I think  
06:03:33 9 I'm more comfortable making a relative  
06:03:39 10 claim which is that among the plans  
06:03:41 11 that I evaluated in this report is one  
06:03:46 12 of --- I think one of the two least  
06:03:50 13 fair.

06:03:50 14 Q. But you can't say it's unfair.  
06:03:52 15 Correct?

06:03:53 16 A. Well, I would say that it's one  
06:03:54 17 of those situations, again, where  
06:03:57 18 there are degrees of, you know, how  
06:03:59 19 close you get to ---.

06:03:59 20 Q. Doctor, I'm not asking you  
06:04:02 21 about degrees. I'm asking are you  
06:04:04 22 testifying that this plan is unfair?

06:04:06 23 A. You know, I don't want to take  
06:04:08 24 a position on one way or the other on  
06:04:11 25 that. So I'm going to say no. I woul

06:04:20 1 say that these are indicators of  
06:04:20 2 unfairness. That's how I would put  
06:04:21 3 it.

06:04:21 4 Q. Thank you.

06:04:21 5 You testified earlier that you  
06:04:23 6 were --- you served as an expert in a  
06:04:26 7 redistricting case in Oregon.

06:04:27 8 Correct?

06:04:28 9 A. That's correct.

06:04:29 10 Q. And did you calculate similar  
06:04:31 11 metrics the regarding the Oregon  
06:04:34 12 Congressional Plan as you've  
06:04:37 13 calculated here?

06:04:37 14 A. I did.

06:04:37 15 Q. And including the efficiency  
06:04:39 16 gap?

06:04:40 17 A. That's right.

06:04:40 18 Q. And were your opinions in  
06:04:42 19 Oregon that the Congressional map in  
06:04:47 20 Oregon was a fair map under partisan  
06:04:54 21 metrics.

06:04:54 22 A. I can bring up exactly what I  
06:04:56 23 wrote but my general --- my  
06:04:57 24 recollection is that my assessment was  
06:04:59 25 that the estimates of the partisan

06:05:06 1 bias of map were mixed and uncertain  
06:05:12 2 and there was a discrepancy between  
06:05:12 3 different measures and also a great  
06:05:14 4 deal of uncertainty depending on  
06:05:16 5 future --- what exactly future  
06:05:17 6 elections would look like. So that  
06:05:19 7 was the rough gist of my ---.  
06:05:22 8 Q. But did you --- did you testify  
06:05:24 9 ultimately in support of that map  
06:05:26 10 being upheld?  
06:05:27 11 A. I did.  
06:05:28 12 Q. And do you recall what the  
06:05:33 13 efficiency gap score gap for the  
06:05:35 14 Oregon Congressional Map?  
06:05:40 15 A. Well, I want to distinguish  
06:05:40 16 between the actual efficiency gap the  
06:05:41 17 and predictions, right, and so the  
06:05:43 18 predicted value --- I don't remember  
06:05:47 19 what it was exactly, but I think it  
06:05:49 20 was probably on the same order of  
06:05:51 21 magnitude as --- the point estimate  
06:05:53 22 was something like this, but there was  
06:05:54 23 a huge amount of uncertainty  
06:05:57 24 surrounding it, if I recall correctly.  
06:05:59 25 Q. I'll represent to you that we

06:05:59 1 ran the Oregon shape files through  
06:06:03 2 Plan Score, the system you used and  
06:06:04 3 the efficiency gap was 8.5 percent.

06:06:07 4 Does that sound right?

06:06:12 5 A. I don't disbelieve you.

06:06:15 6 Q. And that would be over two  
06:06:16 7 percent points higher than what you  
06:06:18 8 calculated as the efficiency gap for  
06:06:19 9 HB-2146.

06:06:21 10 Is that right?

06:06:21 11 A. I believe that predicted value  
06:06:25 12 was higher, but the uncertainty was  
06:06:27 13 much greater. It's also an election  
06:06:30 14 with a state with only five or six  
06:06:40 15 Congressional districts, and the  
06:06:40 16 efficiency gap is not thought to be  
06:06:40 17 particularly reliable in districts ---  
06:06:44 18 in states with fewer than seven.

06:06:44 19 Q. Have you heard of the Princeton  
06:06:46 20 Gerrymandering Project?

06:06:50 21 A. I have.

06:06:51 22 Q. And do you believe it to be an  
06:06:55 23 on authoritative source of information  
06:06:57 24 on partisan fairness?

06:06:57 25 A. No, actually I wouldn't say